POPULAR SCIENCE

MONTHLY

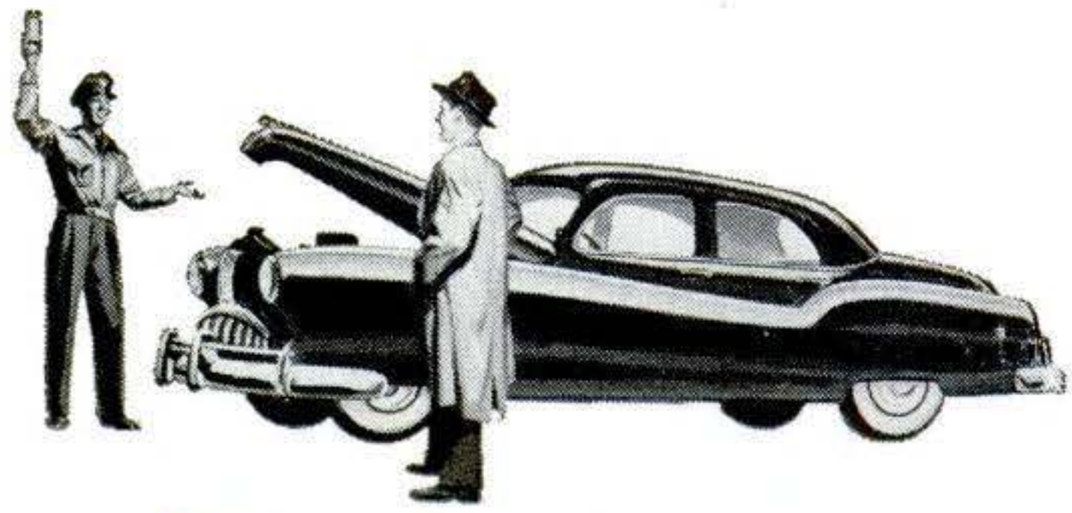
MECHANICS AND HANDICRAFT

All About
Russian Cars
PAGE 106

25¢
October

How to Winterize Your Home
PAGE 177

Before you put in anti-freeze . . .



CLEAN OUT RUST

with

DU PONT

Cooling System

CLEANSER

A rust-clogged radiator overheats, wastes anti-freeze, causes trouble and expense

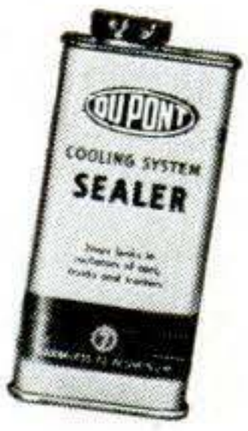
Don't put anti-freeze into a rust-clogged radiator. Clean out the rust, scale and scum *now*, before winter sets in. Just pour a can of DU PONT CLEANSER into your radiator, run the engine for 30 minutes or more, then drain. It's easy to do, cleans thoroughly, safely, without reverse flushing.

After cleaning, keep out rust with

DU PONT
Acid and Rust
INHIBITOR

You can keep your radiator free from rust all season, after cleaning, by pouring in a can of DU PONT ACID and RUST INHIBITOR. Retards rust formation, keeps out acid.

Prevent leaks and loss of anti-freeze with



DU PONT
Cooling System
SEALER

You can stop leaks quickly and securely—and help prevent leaks in the future—by pouring in DU PONT COOLING SYSTEM SEALER. It won't clog the radiator or harm hose or metal parts.

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

Copyrighted material

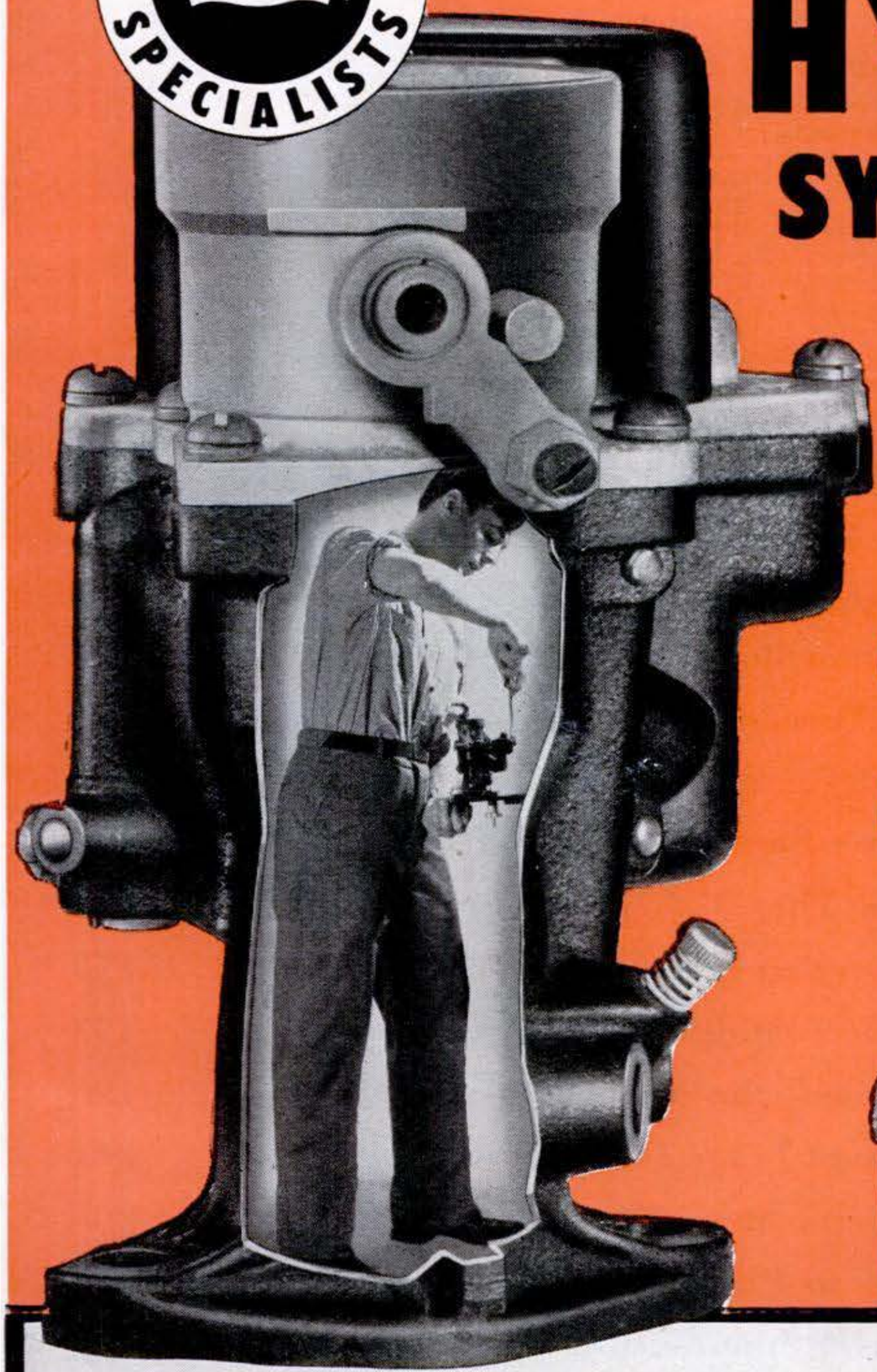
look for this sign

CARBURETOR SPECIALISTS
HYGRADE SYSTEM

SAVE ON GAS...

HAVE YOUR CARBURETOR CHECKED BY YOUR LOCAL

HYGRADE SYSTEM SHOP



He knows carburetors inside-out!

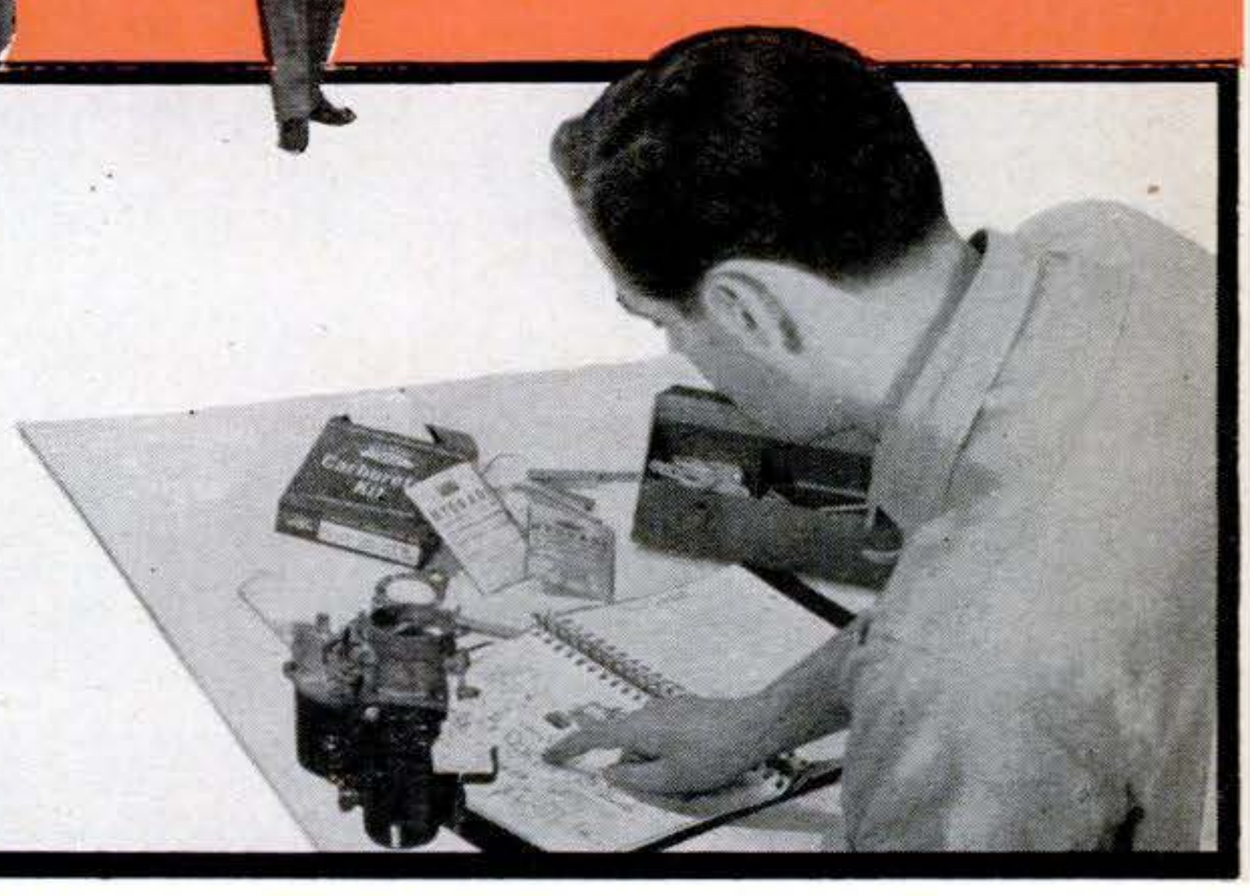
MECHANICS:

Better your business — open a Hygrade System carburetor dept. Become a recognized expert on all carburetors. Send for FREE booklet describing the System. Write today on your letterhead or billhead, to: HYGRADE, 37-18 Northern Blvd., Long Island City 1, New York.

The Hygrade System Shop does a more thorough job because he replaces all the parts that wear with brand new parts. He locates the trouble faster because he uses the revolutionary

HYGRADE SYSTEM

FOR PEAK CARBURETOR PERFORMANCE



HYGRADE: 37-18 NORTHERN BLVD., LONG ISLAND CITY 1, NEW YORK

Copyrighted material

America's Leading New-Idea Magazine for 79 Years

Founded 1872, Vol. 159: No. 4

POPULAR SCIENCE

REG. U. S. PAT. OFF. *Monthly*

Mechanics and Handicraft

VOLTA TORREY, EDITOR

Howard Allaway, MANAGING EDITOR Howard C. Jensen, ART EDITOR

Harry Walton, MECHANICS & HANDICRAFT EDITOR

Hartley E. Howe, Frank Rowsome, Jr., ASSISTANT MANAGING EDITORS

ASSOCIATE EDITORS: Alden P. Armagnac, Devon Francis, Sheldon M. Gallager, Richard Giovine, Kendall W. Goodwyn, Robert Gorman, Herbert O. Johansen, Martin Mann, Denis Sneigr, Robert P. Stevenson.

ART DIRECTOR: Harry Samuels. ART ASSOCIATES: Herbert Anthony, Rolf O. Erickson, Eric Karminski, Jr., Richard Meyer, Frances Cooper Daniels (Production).

EDITORIAL ASSISTANTS: Julia C. Bove, Carol Ennis, Rita K. Gilbert, Rosemary C. Knorr, Georgette Sparks, Harriet Trowbridge, Ruth Westphal.

STAFF PHOTOGRAPHERS: W. W. Morris (Chief), Hubert Luckett, Orlando Guerra (Darkroom).

WESTERN EDITOR: Andrew R. Boone (Los Angeles).

This Month's Big Features:

Gerald Wendt, former dean of Pennsylvania State College's chemistry and physics school, describes the coming atomic airplanes on page 98. After serving as science director of the New York World's Fair, he became editorial director of Science Illustrated, *and is now a noted lecturer on science.*

Scientist Previews First Atomic Plane..... 98

All About Russian Cars.....106

Steel Plant to Be World's Most Modern.....113

Wilbur Shaw Reports on GM's New Engine..125

He Turned a Hobby into a Big Business.....131

Model Railroad Runs on Real Steam.....140

These Cars Are Tailored to Order.....146

How They Make Shotgun Shells.....170

Winterizing Your Home.....177

Undercoating Your Own Car.....193

Gus and the Missing Straddle Truck.....196

How to Judge Used Power Tools.....201

Experts Show You How to Move.....208

How to Photograph Your Boss.....214

Shovel Snow with a Lawn-Mower Engine....225

Heat That Travels Like Light.....230

(More features and departments are listed on page 4.)

Godfrey Hammond, PUBLISHER · Stephen P. Glennon, ADVERTISING DIRECTOR

EDITORIAL OFFICES: 353 Fourth Avenue, New York 10, N. Y.

ADVERTISING OFFICES: NEW YORK — 353 Fourth Ave.; CHICAGO—360 North Michigan Ave.; DETROIT—820 Book Bldg.; SAN FRANCISCO—681 Market St.; CLEVELAND —328 Citizens Bldg.; LOS ANGELES—1052 West 6th St.

Popular Science Monthly is published monthly at 353 Fourth Avenue, New York 10, N. Y., by Popular Science Publishing Co., Inc., Godfrey Hammond, President and Treasurer; R. C. Wilson, Stephen P. Glennon, Vice-Presidents; F. W. Briggs, Secretary. Entered as second-class matter Dec. 28, 1918, re-entered as second-class matter July 26, 1948, at the Post Office in New York, N. Y., under the act of March 3, 1879; additional entry as second-class matter at Dayton, Ohio. Entered as second-class matter at the Post Office Department, Canada. Printed in U.S.A. Copyright, 1951, by Popular Science Publishing Co., Inc. All rights reserved in the United States, Great Britain, and in all countries participating in the International Copyright Convention and Pan-American Copyright Convention. Yearly subscriptions to United States, its possessions and Canada, $3.00 (2 years, $5.50; 3 years, $7.50); foreign countries $1 per year extra. Subscribers must notify us of change of address four weeks before next publication. Be sure to give both old and new addresses, including zone numbers. Vol. 159, No. 4.

Copyrighted material

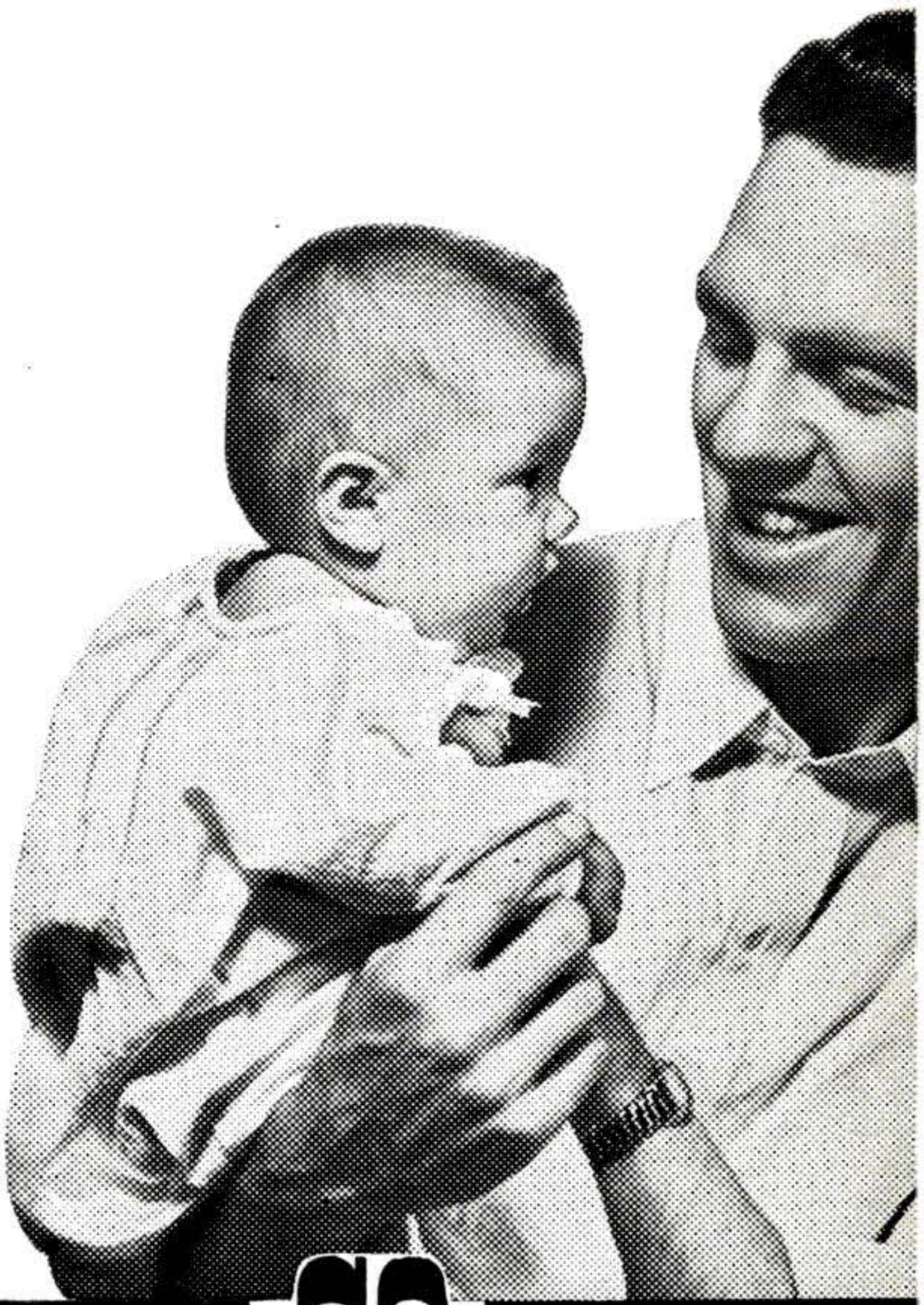
The world on your shoulders

What's ahead for that baby of yours? Happiness? Security? A good education? These, of course, and everything else you can provide. For, above all, you want to be a good father — and a good provider.

That's why you'll find so many young, married men enrolled with the International Correspondence Schools. The average I.C.S. student is 28, employed, married and a father. His biggest concern is security for himself and his family. So he works days and studies nights. And inside of six months, the average student reports a pay raise or a promotion or both. It's a record that we at I.C.S. are proud of — *and a record you can duplicate.*

You owe it to yourself — and your family — to find out more about the "security insurance" that training provides. Information is given free and without obligation. You need only mail the coupon.

Remember, the world is on your shoulders — all ten, precious pounds of it.



INTERNATIONAL CORRESPONDENCE SCHOOLS 60th Anniversary

BOX 7689-M, SCRANTON 9, PENNA.

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

Air Conditioning and Plumbing Courses
- ☐ Air Conditioning
- ☐ Heating
- ☐ Plumbing
- ☐ Refrigeration
- ☐ Refrigeration, Domestic
- ☐ Refrigeration & Air Conditioning
- ☐ Steam Fitting

Aeronautics Courses
- ☐ Aeronautical Engineer's, Jr.
- ☐ Aircraft Drafting & Design
- ☐ Aircraft Mechanic
- ☐ Engine Mechanic

Automotive Courses
- ☐ Automobile
- ☐ Auto Technician
- ☐ Auto Electric Technician
- ☐ Auto Body Rebuilding & Refinishing

Chemical Courses
- ☐ Chemical Engineering
- ☐ Chemistry, Analytical
- ☐ Chemistry, Industrial
- ☐ Food-Plant Sanitation
- ☐ Petroleum Refining
- ☐ Plastics
- ☐ Pulp and Paper Making

Civil Engineering and Architectural Courses
- ☐ Architecture
- ☐ Architectural Drafting
- ☐ Bridge and Building Foreman
- ☐ Building Estimating
- ☐ Civil Engineering
- ☐ Contracting and Building
- ☐ Highway Engineering
- ☐ Reading Structural Blueprints
- ☐ Sanitary Engineering
- ☐ Structural Drafting
- ☐ Structural Engineering
- ☐ Surveying and Mapping

Communications Courses
- ☐ Electronics
- ☐ Practical Telephony
- ☐ Radio, General
- ☐ Radio Operating
- ☐ Radio Servicing
- ☐ Television
- ☐ Telegraph Engineering

Electrical Courses
- ☐ Electrical Drafting
- ☐ Electrical Engineering
- ☐ Electric Light and Power
- ☐ Lighting Technician
- ☐ Practical Electrician

Diesel Engines Courses
- ☐ Diesel Engines
- ☐ Internal Combustion Engines

Mechanical Courses
- ☐ Forging
- ☐ Foundry Work
- ☐ Heat Treatment of Metals
- ☐ Industrial Engineering
- ☐ Industrial Instrumentation
- ☐ Industrial Metallurgy
- ☐ Machine Shop
- ☐ Mechanical Drafting
- ☐ Mechanical Engineering
- ☐ Mold-Loft Work
- ☐ Patternmaking—Wood, Metal
- ☐ Reading Shop Blueprints
- ☐ Sheet-Metal Drafting
- ☐ Sheet-Metal Worker
- ☐ Ship Drafting
- ☐ Ship Fitting
- ☐ Tool Designing
- ☐ Toolmaking
- ☐ Welding—Gas and Electric

Railroad Courses
- ☐ Air Brake
- ☐ Car Inspector
- ☐ Diesel Locomotive
- ☐ Locomotive Engineer
- ☐ Locomotive Fireman
- ☐ Locomotive Machinist
- ☐ Railroad Section Foreman
- ☐ Steam-Diesel Locomotive Eng.

Stationary Engineering Courses
- ☐ Power Plant Engineering
- ☐ Stationary Fireman
- ☐ Stationary Steam Engineering

Textile Courses
- ☐ Cotton Manufacturing
- ☐ Loom Fixing
- ☐ Rayon Mfg.
- ☐ Textile Engineering
- ☐ Woolen Manufacturing

Business and Academic Courses
- ☐ Accounting
- ☐ Advertising
- ☐ Bookkeeping
- ☐ Business Administration
- ☐ Business Correspondence
- ☐ Business Law
- ☐ Cartooning
- ☐ Certified Public Accounting
- ☐ Commercial
- ☐ Commercial Art
- ☐ Cost Accounting
- ☐ Fashion & Book Illustration
- ☐ Federal Tax
- ☐ First Year College
- ☐ Foremanship
- ☐ Good English
- ☐ High School
- ☐ Higher Mathematics
- ☐ Industrial Supervision
- ☐ Motor Traffic
- ☐ Personnel—Labor Relations
- ☐ Postal Civil Service
- ☐ Retailing
- ☐ Retail Business Management
- ☐ Salesmanship
- ☐ Secretarial
- ☐ Sign Lettering
- ☐ Stenography
- ☐ Traffic Management

Name_____ Age_____ Home Address_____

City_____ State_____ Working Hours_____ A.M. to_____ P.M.

Present Position_____ Employed by_____

Special tuition rates to members of the Armed Forces. Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.

Copyrighted material

Picture Features

Doughnut Proposed as Space Station.....120
5 Don'ts for Drivers.....134
They Built a Blimp for Fun.....154
GI Truck Gets Automatic Drive.....158

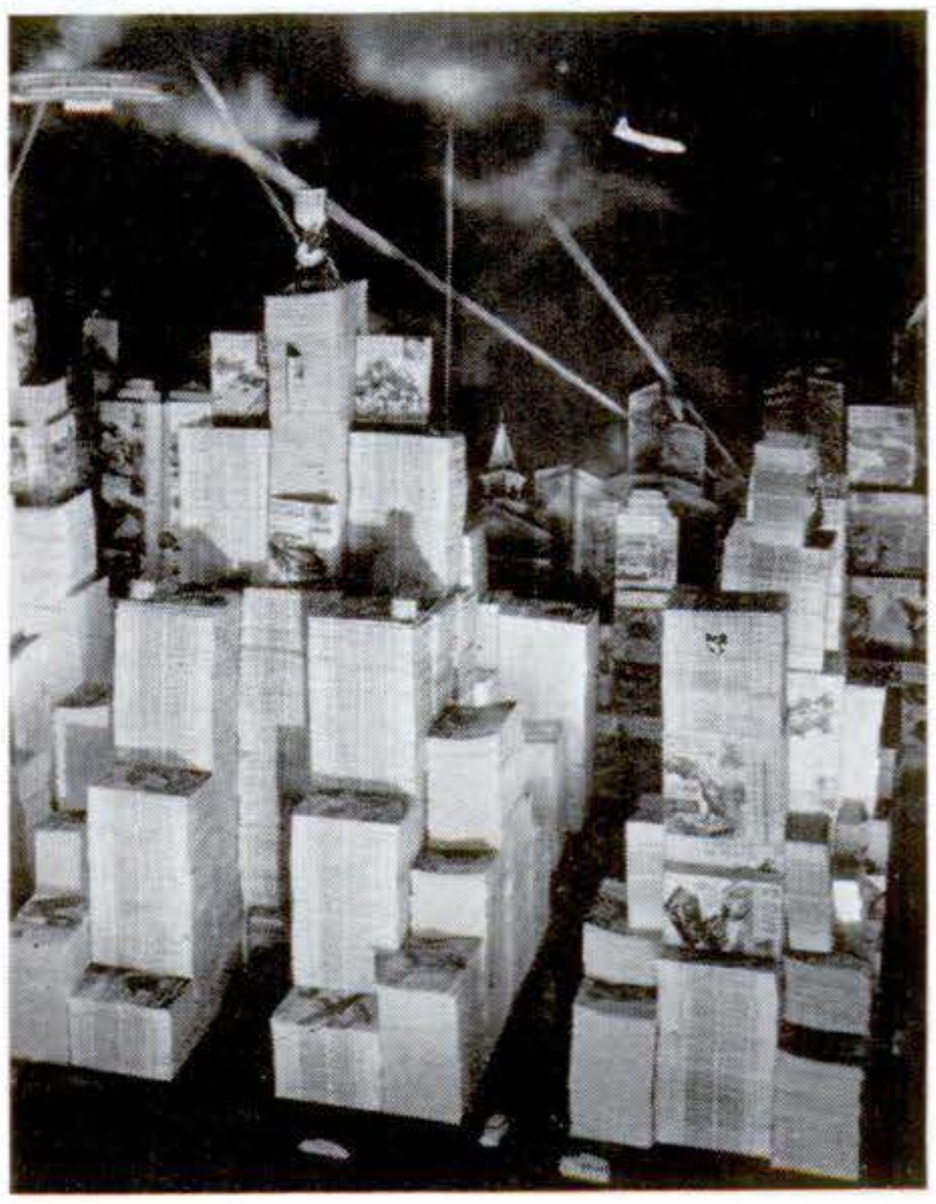
Mechanics & Handicraft

Father and Son Build Hot Rod.....118
Stethoscope Spots Car Noises.....187
What's Inside a TV Doghouse.....218
How to Sharpen Circular Saws.....235

Departments

Letters.....14
New Ideas from the Inventors.....129
Aids to Modern Living.....138
Know Your Weapons.....145
Keeping the Home Shipshape.....151
I'd Like to See Them Make.....160
P.S. Last Minute News and Notes.....176
Hints from the Model Garage.....199
New Tools.....223
New Shop Ideas.....228

You Are "In" This City



Families that read POPULAR SCIENCE MONTHLY own 970,000 automobiles—280,000 more than are owned by all of the families in New York City. These figures inspired Robert R. MacGuire, a New York artist and craftsman, to build this make-believe city. It took several thousand copies of POPULAR SCIENCE to do it —a fraction of the more than a million copies distributed every month.

Copyrighted material

Your voice in Davy Jones' locker

To strengthen voices in the newest submarine cables between Key West and Havana amplifiers had to be built right into the cables themselves. With the cables, these amplifiers had to be laid in heaving seas; and they must work for years under the immense pressure of 5000 feet of water.

For this job, Bell Laboratories engineers developed a new kind of amplifier — cable-shaped and flexible, with a new kind of water-tight seal.

To serve far beyond reach of repair, they developed electron tubes and other parts, then assembled them in dust-free rooms.

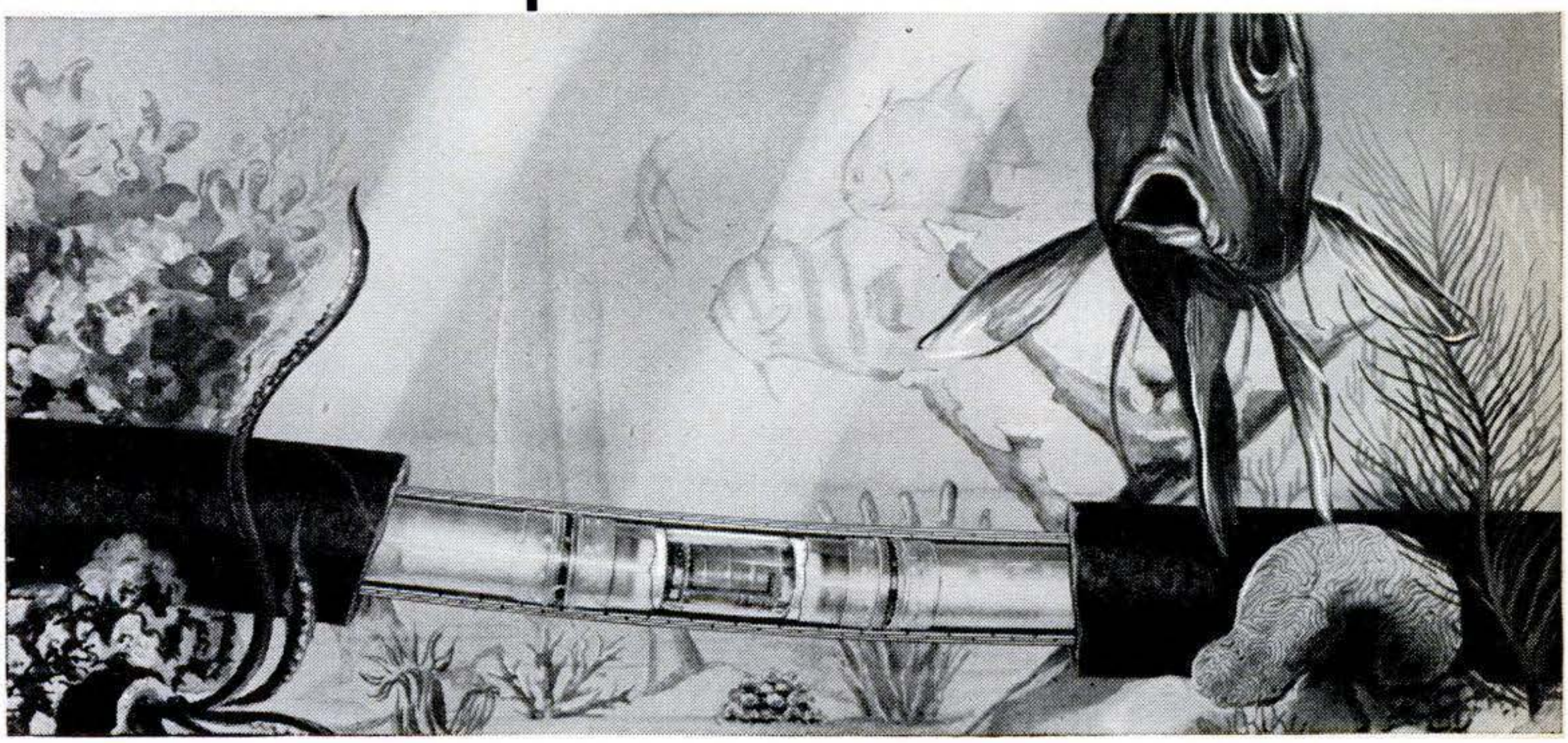
The two cables — each has but two conductors — simultaneously carry 24 conversations as well as current to run the electron tubes.

With these deep-sea amplifiers, submarine cables carry more messages . . . another example of how research in Bell Telephone Laboratories helps improve telephone service each year while costs stay low.

BELL TELEPHONE LABORATORIES

• *Exploring and inventing, devising and perfecting, for continued improvements and economies in telephone service.*

Cutaway view of deep-sea amplifier. Tubes and other elements are housed in plastic cases then enclosed in interleaved steel rings in a copper tube. Glass tape, armor wire and impregnated fiber complete the sheath.



Copyrighted material

RCA Service technicians, during their unique training program, live and breathe the subject of television—for your benefit.

These men get TV's Inside Story

When you buy a quality television receiver, correct installation and maintenance are as important as the set. For service technicians, RCA has developed the only training program of its kind—a *factory* program.

During their studies, these men learn the basic facts of modern, all-electronic TV... how it reached its present perfection by research at RCA Laboratories ... how to build a receiver ... how to select and install the right antenna for your *home*... all the complexities of kinescopes, electron guns, TV cameras and transmitters.

When their studies have been completed, they have a grasp of television's *inside story* that assures you the most perfect installation and maintenance possible—under your RCA Victor Factory-Service Contract.

See the latest wonders of radio, television, and electronics at RCA Exhibition Hall, 36 West 49th St., N.Y. Free admission. Radio Corporation of America, RCA Building, Radio City, N. Y. 20.

Get all the performance that's built into your new RCA Victor home television receiver through an RCA Victor Factory-Service Contract.

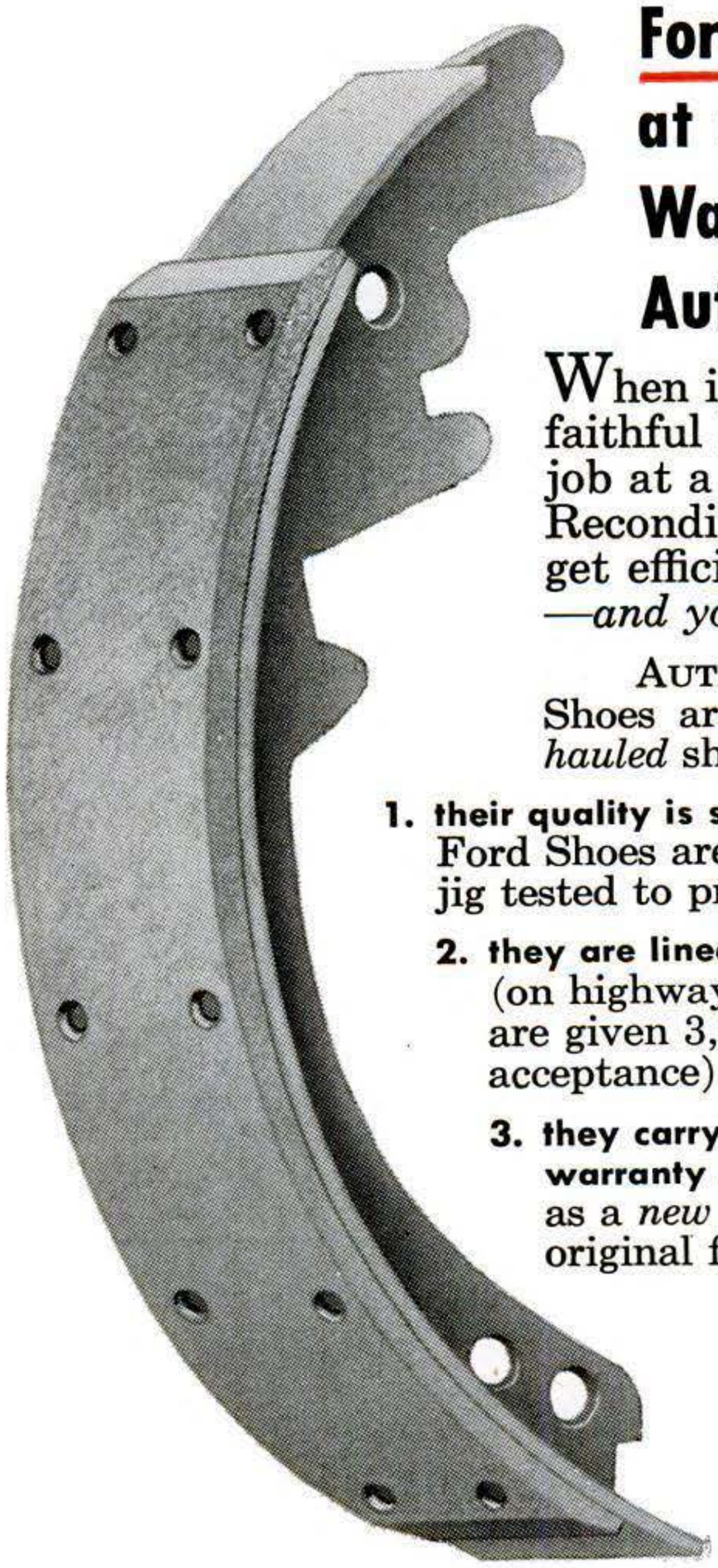
RADIO CORPORATION of AMERICA

World Leader in Radio — First in Television

Copyrighted material

Exclusive for Ford Owners!

BUY AUTHORIZED RECONDITIONED



Ford Brake Shoes at a real saving! Warranted by Ford Authorized Reconditioners!

When it's time for new brakes on your faithful Ford, here's the way to do the job at a saving! With AUTHORIZED Reconditioned Ford Brake Shoes, you get efficient, long-lasting braking power! —*and you save a great deal of money!*

AUTHORIZED Reconditioned Ford Brake Shoes are superior in many ways to *overhauled* shoes:

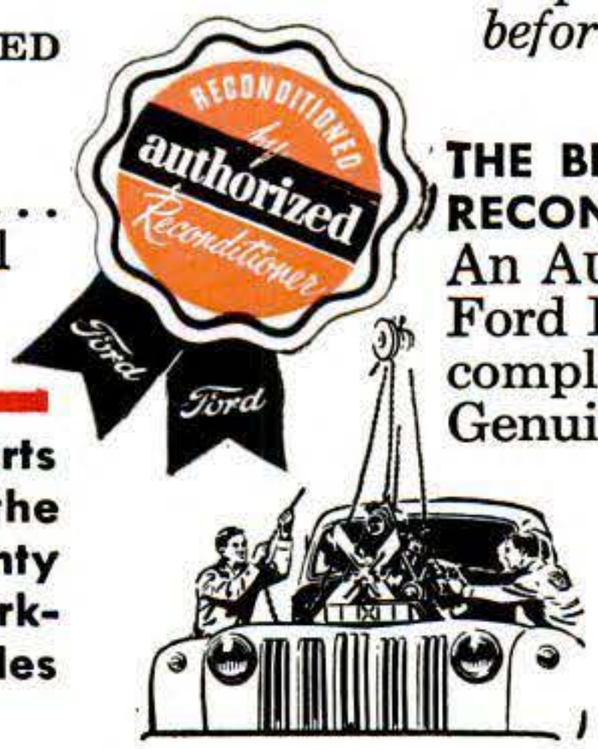
1. **their quality is superior.** (AUTHORIZED Reconditioned Ford Shoes are completely stripped, cleaned and jig tested to print specifications) . . .
2. **they are lined with Genuine Ford Brake Linings** (on highways and test tracks, Ford linings are given 3,250 emergency stops before acceptance) . . .
3. **they carry the AUTHORIZED Reconditioner's warranty** assuring the same high quality as a *new* shoe (all brake shoe parts meet original factory specifications).

And here's another important fact—all shoes are rebuilt in the plants of Ford-authorized, Ford-inspected Reconditioners. *Only brand-new Genuine Ford Parts are used!* If you're not sure of your *present* brakes, let your neighborhood Ford Dealer give your car a brake shoe inspection. He can spot trouble *before* your brakes give out.

Save dollars, too, *with other* AUTHORIZED Reconditioned Ford Parts . . . Carburetors . . . Fuel Pumps . . . Distributors . . . Voltage Regulators . . . Generators . . . Starting Motors! All carry Reconditioner's warranty.

LOOK FOR THIS EMBLEM

on the engine or reconditioned parts you buy. It's your assurance of the AUTHORIZED Reconditioner's warranty against defects in material and workmanship for 90 days or 4,000 miles (whichever occurs first).

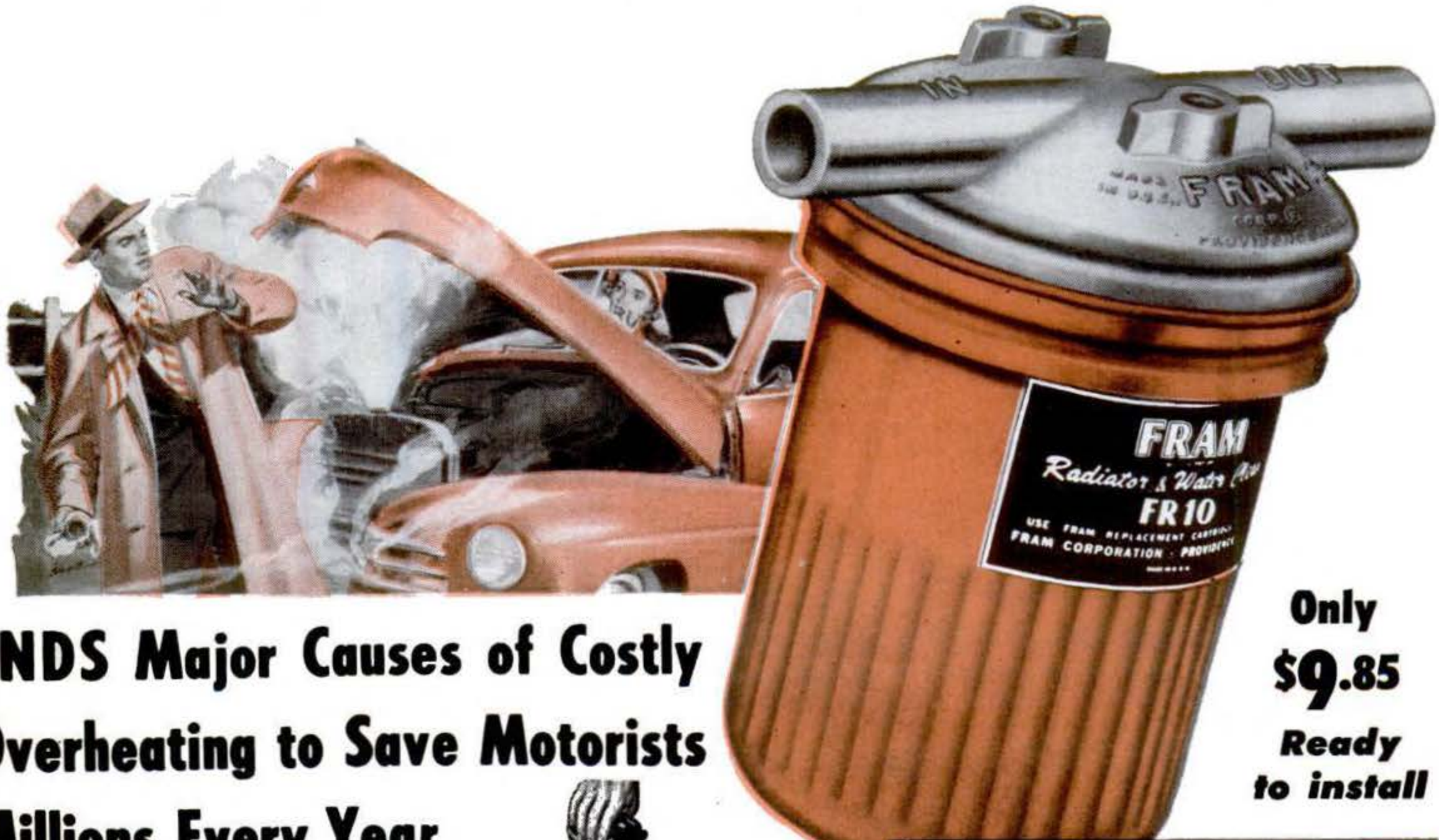


THE BIGGEST RECONDITIONED "PART" OF ALL! An AUTHORIZED Reconditioned Ford Engine has over 150 new or completely reconditioned Genuine Ford Parts . . . gives you new-engine power for about half the cost of a new engine!

Copyrighted material

Stop Rust, Scale, Dirt

with NEW FRAM Radiator & Water Cleaner



Only $9.85
Ready to install

ENDS Major Causes of Costly Overheating to Save Motorists Millions Every Year

SENSATIONAL NEW FRAM Radiator & Water Cleaner filters out foreign particles! Inhibits rust and corrosion! Softens the water to prevent scale! Harmless to antifreeze or other radiator chemicals.

RUST, SCALE, DIRT are trapped inside the economical replacement cartridge. This cartridge, which contains softener and inhibitor, can be easily changed with a twist of the wrist.

FRAM
OIL • AIR • FUEL • WATER
FILTERS

$100,000,000 A YEAR is wasted on repairs caused by faulty cooling systems . . . warped valves, frozen rings, ruined radiators, cracked heads and blocks. Protect your engine and your pocketbook with Fram.

FITS CARS, TRUCKS AND TRACTORS . . . See your Fram Dealer. You don't risk a red cent. The new Radiator & Water Cleaner is unconditionally guaranteed.

FRAM CORPORATION, Providence 16, R. I.
In Canada: J. C. Adams Co., Ltd., Toronto, Ont.

World's leading manufacturer of oil, air, fuel and water filters for the automotive, aeronautical, marine and industrial fields.

Call Western Union by number and ask Operator 25 for the name of your nearest Fram Dealer.

Copyrighted material

Let me send You FREE PROOF

that you can become an expert

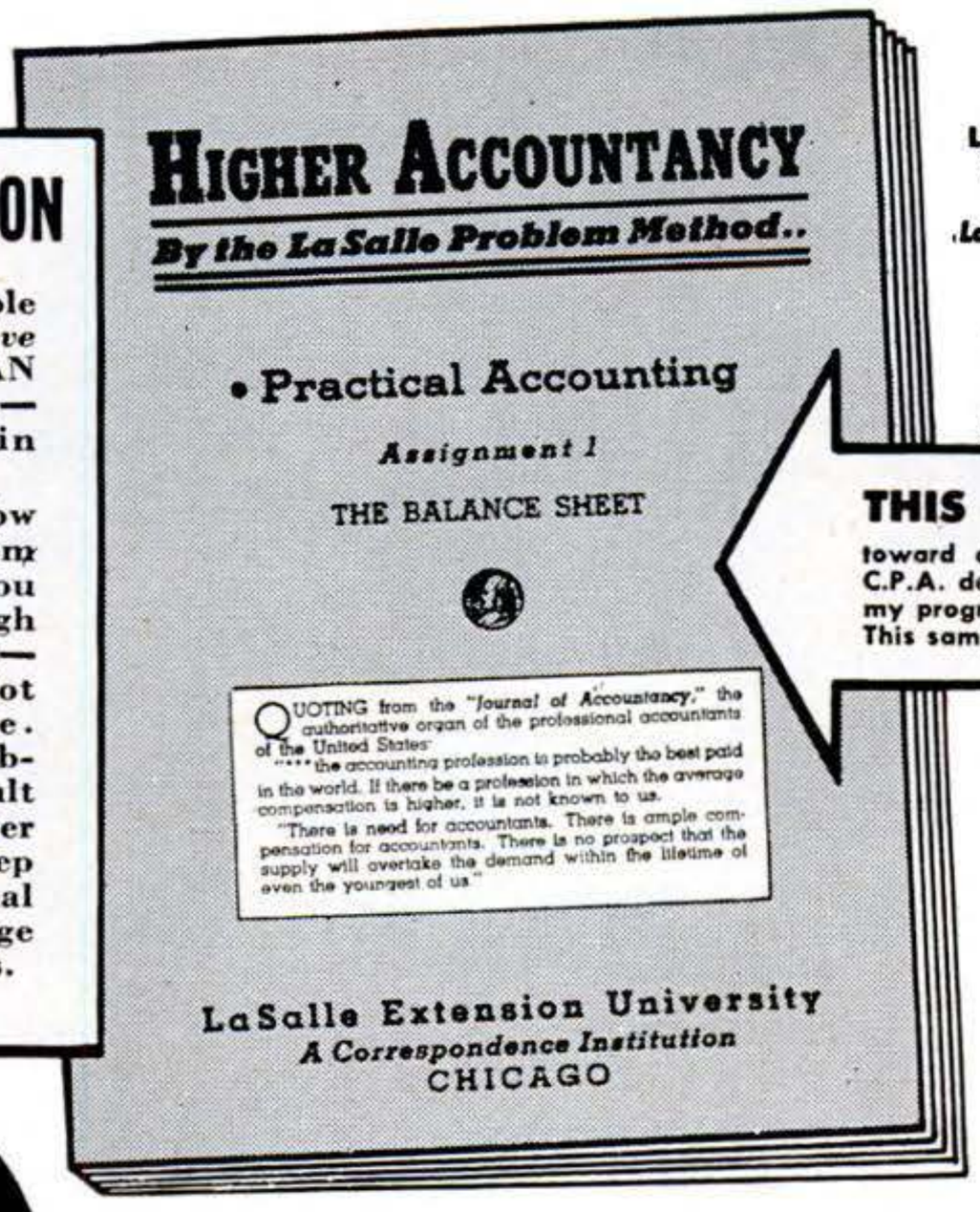
ACCOUNTANT... BOOKKEEPER OR C.P.A.

LOWELL C. DOAK
C. P. A., M. B. A.
Director of LaSalle Accountancy Instruction

FREE SAMPLE LESSON

I offer you this free sample lesson so that you can *prove to yourself* that you CAN master Accountancy—quickly, thoroughly—in spare time at home.

You will see exactly how LaSalle's famous "Problem Method" works . . . how you are led step-by-step through actual accounting work—*learning by doing* and not by study of theory alone. First you tackle easy problems, then more difficult ones—until soon you master them all. And at every step you have the close personal guidance of LaSalle's large staff of C.P.A. instructors.



THIS SAME LESSON STARTED ME

toward a well-paid public accounting career—and my C.P.A. degree. I knew nothing of accounting before—yet my progress was rapid—my earning power climbed fast. This sample lesson will show you why.

Nearly 10% of all C.P.A.'s in the U.S. have been trained by the LaSalle Problem Method

IF you have been envying the high incomes and good jobs enjoyed by thousands of men and women Accountants today . . . incomes ranging from $4,000 to $10,000 and more per year . . . why not launch such a career for yourself?

Do you doubt that you can?

Then let me send you—without cost or obligation—the same Lesson Number One with which LaSalle has started several hundred thousand men and women toward successful accounting careers. I want you to see for yourself how this remarkable method, originated by LaSalle, makes Accountancy simple, interesting, practical, and certain . . . how it leads you step-by-step to a complete mastery of Accounting—and on up to the coveted degree of Certified Public Accountant if you so aspire.

It doesn't matter whether you've had previous bookkeeping experience, or whether you don't know a debit from a credit. Whether you wish to qualify as an expert bookkeeper, advanced accountant, cost accountant, auditor, government accountant, income tax specialist, or public accountant . . . you'll find in LaSalle's Problem Method the exact plan to prepare you rapidly and inexpensively—in spare hours at home—without losing a day from your present job.

So right now, today . . . if you are an adult, employed, and earnestly ambitious for rapid advancement in this highest-paying of all professions . . . send your name and address to me on the coupon below. I'll send the free sample lesson—plus our 48-page book outlining today's career opportunities and how you can qualify for them. A coupon like this has started many thousands toward greater success. It can do the same for you. Mail it today!

GOOD-PAY JOBS IN 5 BIG FIELDS

If you were an expert accountant right now, chances are you would find yourself among the highest-paid of all professional men and women. Surveys show that accountants earn more than those in other major professions.

There are five big fields of opportunity open to Accountancy-trained men and women . . . opportunities that are wide open and highly inviting, offering maximum income and job security in good times or bad. And under LaSalle's "Problem Method" you can start earning while still learning—either in spare-time or full-time employment . . . or in business for yourself with no capital required.

Get the latest information by sending for our 48-page book, "Accountancy, the Profession That Pays"... plus free sample lesson. The coupon at right will bring both to you without cost or obligation. LaSalle Extension, 417 S. Dearborn St., Chicago 5, Ill.

Clip Coupon . . . Mail TODAY!

LaSalle Extension University . . . *A Correspondence Institution*
Dept. 1083H, 417 S. Dearborn Street, Chicago 5, Illinois

YES, MR. DOAK, I want to see how LaSalle's "Problem Method" works . . . how I can qualify for high-pay Accountancy positions. Also, send your 48-page book, "Accountancy, the Profession That Pays"... all without cost or obligation.

Name . . . . . *Age* . . . . .

Street Address . . . . . .

City, Zone & State . . . . . .

Present Position . . . . . .

Copyrighted material

WANTED—
MEN TO ATTEND THIS SCHOOL!

Administration Building, U. S. Army Engineering School, Ft. Belvoir, Virginia

A FEW ARMY-TAUGHT TECHNICAL COURSES

AUTOMOTIVE MAINTENANCE
MEDICAL EQUIPMENT REPAIRMAN
LOCOMOTIVE REPAIRMAN
ELECTRICIAN
TIRE REBUILDER
TELETYPE REPAIRMAN
MAP REPRODUCTION
SURGICAL TECHNICIAN
LEADERSHIP COURSE
CONSTRUCTION MACHINE OPERATOR
WATER SUPPLY TECHNICIAN
—And Many Others

RECRUITING
U.S. ARMY
U.S. AIR FORCE

Thousands of intelligent young men are needed now to attend the Army's enlisted technical schools and learn vital, interesting jobs. This chance is waiting for you, too, if you move fast while there's still a need for technically trained men. Typical of the Army institutions is the Engineering School. Here, soldiers graduate into many different engineering fields, from surveying to bridge-building.

Aptitude Tests—When you enlist the Army will test you to find out the field you're most suited for. You'll then be assigned to learn under the world's finest instructors and develop your special skills. When you graduate, you'll find opportunities for promotion waiting—and you'll proudly wear the uniform that's "the mark of a man." Get the facts at your U. S. Army and U. S. Air Force Recruiting Station.

U. S. ARMY

Copyrighted material

train for

ELECTRICITY or TELEVISION-RADIO

on real equipment in the great shops of

Coyne

- good job opportunities now
- interesting work
- better future

Be a success! PREPARE yourself—the easier way at COYNE. Whether 16 or 50, start training now for a job with a real future in ELECTRICITY or TELEVISION-RADIO. Learn from State-approved instructors—who have worked on the job themselves. Train where thousands of successful men have been trained for over half a century. **Established in 1899.** Get a Coyne diploma when you graduate . . . *a sign of recognition.*

NOT "HOME STUDY" COURSES

You learn quickly, the most practical way at Coyne . . . on real equipment. Experienced instructors show you how. No advanced education or previous experience needed.

Start Now—Pay Later—Small down payment starts you—balance in easy payments later. If you need part-time work to help meet living expenses while at Coyne, we'll help you get it. *Courses approved for qualified veterans.*

TRAIN NOW FOR A VITAL JOB IN INDUSTRY OR HIGHER RATING AND BETTER PAY IF DRAFTED

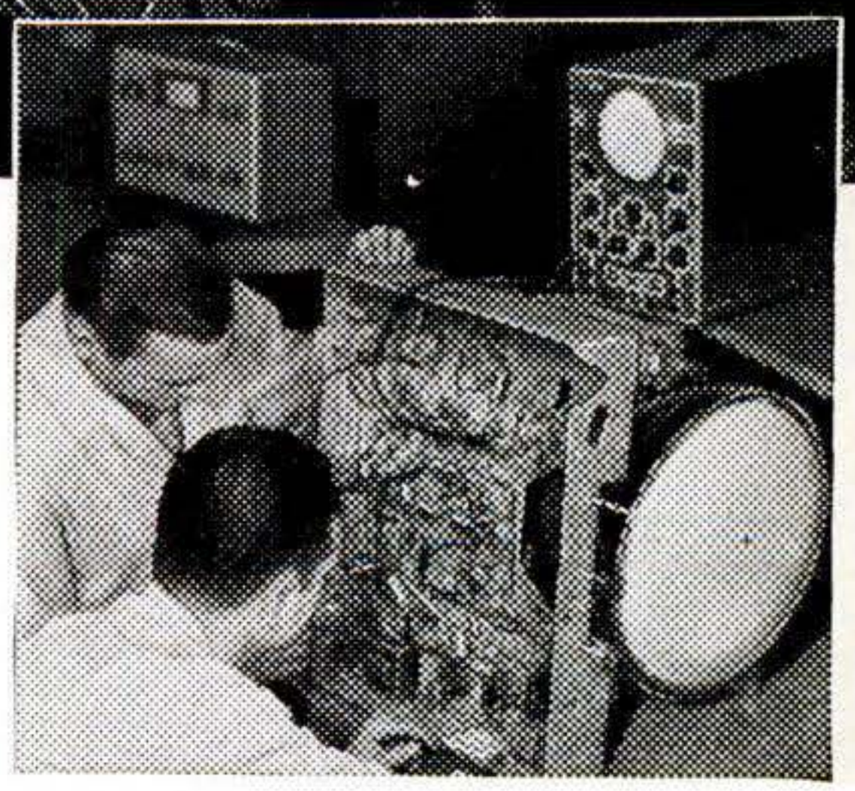
ELECTRICITY, TELEVISION, RADIO and ELECTRONICS play a vital role in Nation's Defense program. Uncle Sam needs thousands of men in and out of uniform who are trained in their fields. So does Industry. And these jobs are just as necessary after the present emergency. Electricity and Electronics are big opportunity fields under all conditions. Television-Radio is a newer field that is growing like wild fire. Government is about to authorize hundreds of new TV stations. **Send for Big Free Book** and facts about how you can prepare quickly for these great opportunity fields. Send coupon today.

B. W. Cooke, President

COYNE ELECTRICAL & TELEVISION-RADIO SCHOOL

Chartered As An Educational Institution Not For Profit

500 S. Paulina St. Dept. 71-73H Chicago 12



Get Big Free Book Today

If you want to get ahead... learn either of these two vital fields . . . be a success — ***SEND THE COUPON BELOW,*** for big, illustrated Coyne book. Mail it today—facts by return mail. ***No salesman will call.***

B. W. Cooke, President
COYNE ELECTRICAL &
TELEVISION-RADIO SCHOOL
500 S. Paulina St., Chicago 12
Dept. 71-73H

Send your BIG FREE BOOK and details of your training offer. I am interested in

☐ ELECTRICITY ☐ TELEVISION-RADIO

NAME.....

ADDRESS.....

CITY.....STATE.....

Copyrighted material

LEOPARD SEAT COVERS

SWEEP TO SENSATIONAL NATIONAL POPULARITY

EXCLUSIVE WITH "KEY" AGENTS

Salesmen jamming pockets with $10.00 bills!

TAKING ORDERS FOR "KEY" EXPERTLY TAILORED AUTO SEAT COVERS!

LOOK AT THESE FEATURES

- Extra Fine Fit and Tailored Appearance
- Seven Different Designs — Seven Price Ranges
- Every Car Owner A Prospect

The "Leopard"

The selling sensation of the year! Satin-like, its iridescent sheen delights the eye. Beautiful "Leopard" cloth trim assures the ultimate in sheer luxury.

FOR ALL CARS— ALL YEARS— ALL MAKES AND MODELS

BIG SEASON NOW STARTING

The "Pacemaker"

Genuine fibre seat covers, plastic coated, to wash easily. Will not stain. Sheds dirt and dust like a duck sheds water. Beautiful Plaid design blends with any car interior. Brings a new conception of driving comfort.

The "Streamliner"

The multi-colors of this genuine Saran Woven Plastic complement the colors of the car's upholstery. The finest you can buy, Saran Woven Plastic is impervious to climatic conditions. Snag proof. Waterproof. Flame resistant.

You've heard of the tremendous demand for Leopard auto seat covers that built up overnight from one end of the country to the other. Car owners are paying $50.00, $60.00 and $70.00 and more for car seat covers with Leopard design. Now you can serve that eager demand at a fraction of the cost your customers would expect to pay! No wonder salesmen are making money hand over fist with this sensational new Key Seat Cover line!

Make big money daily. Take orders from car owners everywhere. Permanent year around income. Meet and beat all competition with covers cut to accurate patterns like the finest suit of clothes. Slick, wrinkle-free fit adds an accent of elegance to any car . . . just like an original upholstery job! **CASH IN ADVANCE DAILY.** Direct-from-factory low price. Customers expect to pay twice as much as the low price you quote for these genuine, expertly tailored Auto Seat Covers. Your customers instantly recognize the real bargain you are offering! And you make top profit on each sale! Earnings in advance every day!

COMPLETE SALES KIT FREE!

Nothing at all to buy. Complete sales kit including actual samples of materials used - trim, Leopard cloth, plastic, leatherette, etc. Beautiful illustrations. Big supply of C.O.D. order taking forms. Everything you need to start cashing in immediately. Get in on this lucrative business. Write for selling kit, including Bonus Offer of FREE Seat Covers for your own car.

JUST SEND COUPON

ALL FREE!

RUSH NAME FOR FREE SAMPLE

Give Make, Year and Model of Your Car

Anyone working full or spare time can realize big money. No need to search for prospects. Every car owner is one. Make year around STEADY PROFITS. Get free selling kit at once. ACTUAL SEAT COVERS GIVEN FREE TO PRODUCERS FOR OWN USE! Write for full details —or mail coupon below—TODAY!

KEY PRODUCTS CORP.
800 No. Clark St., Dept. 6-S, Chicago 10, Ill.

KEY PRODUCTS CORP., DEPT. 6-S
800 N. CLARK STREET, CHICAGO 10, ILLINOIS

Rush me Free Sample Outfit at once so that I can start making real money with Key Products. (If you own a car include the following information):

MAKE OF CAR.....YEAR.....

MODEL..... ☐ 2-Door ☐ 4-Door

NAME .....

ADDRESS .....

CITY..... STATE.....

Copyrighted material

VOTE TODAY

FOR THE FUTURE YOU WANT!

AMERICAN SCHOOL, Dept. G746, Drexel at 58th, Chicago 37, Ill.
Without obligation, please send FREE and postpaid, full particulars about the subject checked below.

- ☐ Accounting
- ☐ Air Conditioning
- ☐ Architecture & Building
- ☐ Automotive Technician
- ☐ Better Foremanship
- ☐ Bookkeeping
- ☐ Business Management
- ☐ Contracting
- ☐ Diesel Technician
- ☐ Drafting—Building Trades
- ☐ Drafting—Machine Trades
- ☐ Electrical Engineering
- ☐ Electricity—Practical
- ☐ Electronics—Industrial
- ☐ High School Courses
- ☐ Machine Shop Operations
- ☐ Mathematics & Slide Rule
- ☐ Mechanical Engineering
- ☐ Plastics Engineering
- ☐ Plumbing—Practical
- ☐ Private Secretary
- ☐ Refrigeration
- ☐ Retail Merchandising
- ☐ Salesmanship—Outside
- ☐ Sheet Metal Work
- ☐ Tool Making

NAME ..... OCCUPATION .....
HOME ADDRESS ..... AGE .....
CITY ..... STATE .....

THIS IS YOUR BALLOT

Check the career that interests you most, Fill in spaces and mail at once—no obligation

● *Today,* choose the job you want — and prepare for it in spare time at home. Or if you are already engaged in the work you like best, start training *now* for quicker promotion. In hours you might otherwise waste, gain the knowledge and skill that can help you to get ahead faster, make more money, and have greater security.

Thousands before you have followed this plan and were able to step out ahead of others who didn't fit themselves for advancement or who seemed willing to trust to luck.

Training Backed by 54 Years of Experience

For over half a century American School has helped ambitious men and women toward success by providing specialized training for commercial and technical advancement. At a cost you can afford *you* can prepare *at home* to climb in the kind of work you prefer. American School's study program for *you* has been planned by experts with years of experience in the subject you select and they will give you needed guidance every step of the way.

Don't Delay Your Start

Give serious thought to the list of training courses listed above. Pick the opportunity that interests you, check it and add your name and address. (Check more than one if you are undecided as to which appeals most.) Finally clip out and mail the "ballot" and full information will be supplied, without cost or obligation.

PRACTICAL, EFFECTIVE HOME STUDY TRAINING SINCE 1897

AMERICAN SCHOOL, Dept. G746, Drexel at 58th, Chicago 37, Ill.

THE SOONER YOU START, THE SOONER YOUR GOAL CAN BE REACHED

Copyrighted material

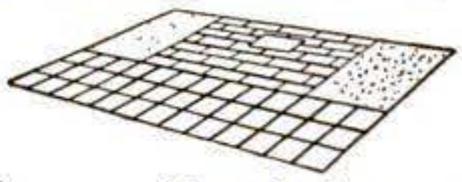
Build A FIREPLACE

around this scientifically designed steel form which also provides circulating heat that assures perfect fireplace operation.

free folder tells how

TELLS HOW TO BUILD YOUR FIREPLACE—*Step by Step*

- Foundation
- Steel heat-circulating form
- Cold and warm air ducts
- Chimney and flue construction
- Mantel or decorative front

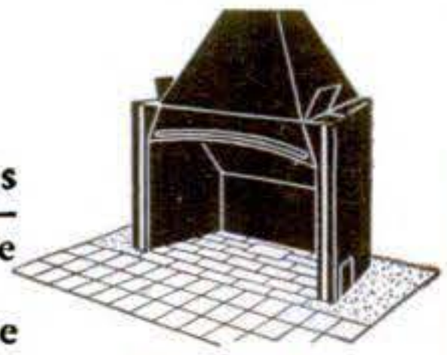


Foundation

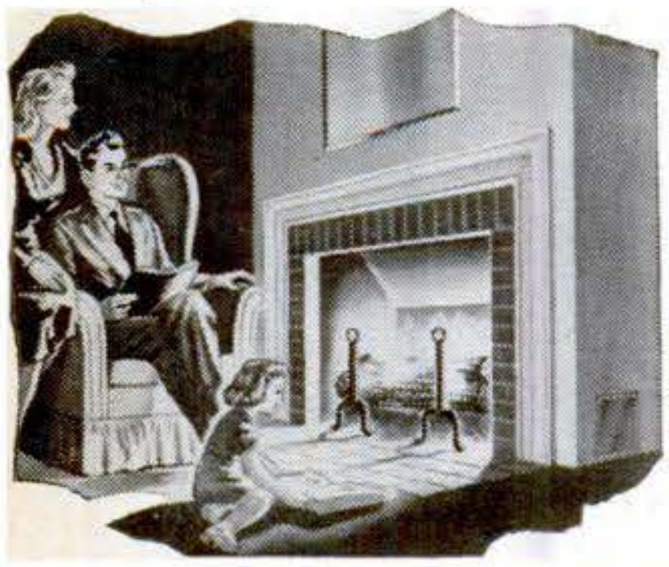
ASK FOR BOOK "100 FIREPLACE IDEAS"

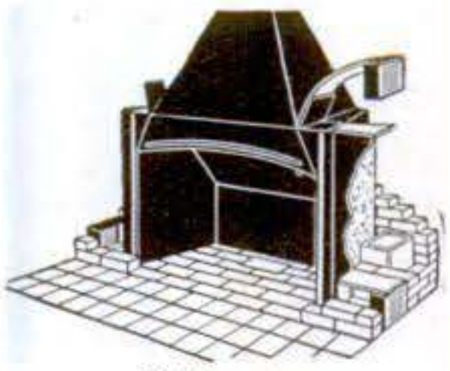
Beautiful fireplace designs modern and conventional—shows artistic use of available material.

Enjoy circulating heat and the radiance of an open fire in your *Home, Playroom, Cottage* or *Camp.*



Fireplace form set on foundation includes firebox, damper, down draft shelf and smoke dome.





Brick, stone or cement block can be used around the form.

- ☐ Send free directions for building heat-circulating fireplace.
- ☐ Send Book "100 Fireplace Ideas." Pocket size, book, sent free.
- ☐ Send larger book, 8½ x 11, beautifully illustrated, 25c.
- ☐ Send outdoor fireplace folder with 10 beautiful designs Free.

Name .....

Street .....

City .....

Sold Through Leading Building Materials Dealers

PRICE FIREPLACE HEATER & TANK CORP.
192 W. Austin Street, Buffalo 7, New York

Letters

Bike Hitches Car Ride

Why the "bicycle" wheel on the back end of the Cadillac shown in the picture on bottom of page 49 in July? Presume it is some testing device, but what for?

JOHN HOWARD, Seattle

See page 126.

PS Joins the Navy

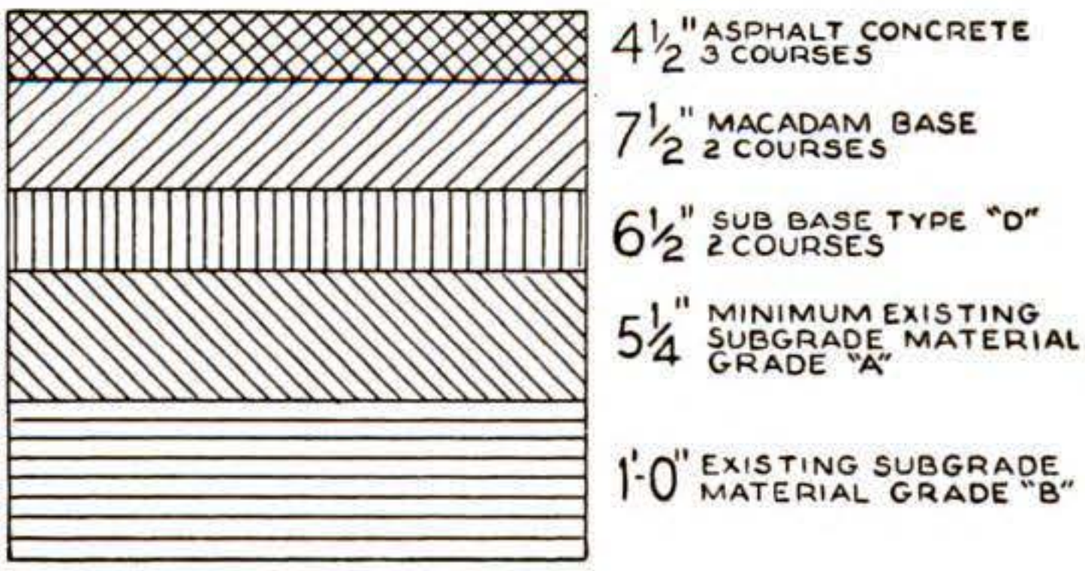
I have been a POPULAR SCIENCE reader for a number of years; in fact, I have retained all of the issues since 1943 excepting two. What impresses me the most is the variety of articles to be found. I feel that PS has helped to create and develop my interests a hundred-fold.

HOWARD J. WILSON, Department of Defense Office of Naval Research, Washington, D. C.

Getting Back on the Road

This is with reference to your article in the July issue regarding the New Jersey Turnpike.

The cross section of the highway as shown in the top right-hand corner of page 74 is a little different from the one we are using. For your information, topsoil is only used in the area that is to be seeded.



I am enclosing a Turnpike cross section [above] which shows a one-half section of the New Jersey Turnpike as built in Section 2.

JOHN A. MCFARLAND
Ass't Resident Engineer
Gannett Fleming Cordry
and Carpenter, Inc.
Barrington, N. J.

Thanks to Mr. McFarland for giving us the latest data on the paving, which is now

Copyrighted material

INVENTORS

Learn how to protect your invention. The U. S. Patent Laws provide that any new and useful art, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if the act of invention is involved. Therefore, every inventor with a valuable invention should take advantage of the Patent Laws and proceed for patent protection in order to safeguard his rights.

A patent gives the inventor the exclusive right to prevent others from making, using, or selling the invention claimed in the patent for a period of seventeen years.

The Patent Laws were enacted for the benefit of the inventor to give him protection for the features of his invention which are patentable. These features must be properly and concisely set forth and claimed in a formal application for patent, in order to comply with the requirements of the Patent Laws. For that reason, unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and are prepared to serve you in the handling of your patent matters.

A specially prepared booklet entitled "Patent Guide for the Inventor", containing detailed information with respect to patent protection and procedure, together with a "Record of Invention" form will be promptly forwarded to you without obligation upon request.

CLARENCE A. O'BRIEN & HARVEY JACOBSON

Registered Patent Attorneys

12-K DISTRICT NATIONAL BUILDING

WASHINGTON 5, D. C.

Copyrighted material

Aha! Help for the Hobbyists!

offered by these Wizards with Wood

Hobbyists delight in results made possible by Weldwood Glue, Firzite and Satinlac. Ask for these magic hobby-aids at hardware, paint and lumber dealers, or mail coupon below for free leaflets.

Newer than Shellac or Varnish

Pints, Quarts, Gallons

For "natural wood" finishes on furniture, panelling or woodwork, there's nothing like Satinlac. Brings out natural grain and color beauty of any plywood or solid wood. Avoids that "built-up" look; will not turn yellow or darken with age. "Water-clear," easy to brush or spray, dries ready for next coat in 2 or 3 hours.

SATINLAC*

Glue That's Stronger than Wood

To make things or fix things, use Weldwood Glue for all wood-to-wood bonds. Makes joints stronger than the wood itself. Mixes easily with water. Stain-free, rot-proof...highly water-resistant!

WELDWOOD®
PLASTIC RESIN GLUE

A MUST for Finishing Fir Plywood

Tame that wild grain with FIRZITE. Virtually prevents grain raise or checking... readies the surface satin-smooth for paint, stain or enamel. (For blond, pickled, or tinted effects on soft or hard woods, use White Firzite).

FIRZITE*

*Trade Marks

United States Plywood Corporation,
Dept. 319, 55 West 44th St., New York 18, N. Y.
Send me free leaflets on Weldwood Glue, Firzite and Satinlac.

NAME_____

ADDRESS_____

being put in place on the New Jersey Turnpike. When George Waltz and Bill Morris gathered the information and photographs for the July story, the paving operation had not yet begun. Also, the roadbed varies somewhat from section to section. Thus the discrepancies in the thicknesses of the various layers. The label "Top Soil," however, was a typographical error. It should have read "Top Base," according to information received at that time.

Asked for It—Got It

In your June issue on page 143, Mr. E. R. Whitney "Would Like to See Them Make" a rubber molding strip for car doors.

I am enclosing a photo [below] of our rubber molding installed on a Packard. This

item has been on the market for about two years, sells for $1.00 per set of two strips, and can be applied to practically 95 percent of the cars now in use.

RAY A. BRAINARD, West Hollywood Craft Shop, Hollywood, Calif.

Could Anyone Help?

I have just obtained a 1923 Jewett sedan and would like to locate a service manual or other information that would help me restore it to good condition.

WILLIAM PENNANAN, 531 N. Main St. Rochester, Mich.

Well Traveled Piston; Well Split Hair

Those Wilbur Shaw "Reports from the Driver's Seat" are swell. But I've noticed something funny in the fact boxes giving

Copyrighted material

INVENTORS

If you believe that you have an invention, you should find out how to protect it. The first step is to have a search made of the prior pertinent U. S. patents. If a report on this search indicates that the invention appears patentable you can apply for a patent, and the specifications and claims should be prepared.

The firm of McMorrow, Berman & Davidson, with offices in Washington, D. C., is qualified to take the necessary steps for you. We can make a preliminary search on your invention, advise you whether we think it can be patented, and prepare your application for patent.

Unless you are fully familiar with the U. S. Patent Laws, we recommend that you engage the services of a Registered Patent Attorney to protect your interests. The patent laws are *your* laws. A patent gives you the right to prevent others from making, using or selling the invention claimed in your patent for a period of 17 years.

Use these patent laws for your protection. Investigate whether your invention can be patented. If you have what you believe to be an invention, we suggest that you have this firm make a search for you.

Send for a copy of our Patent Booklet entitled "How To Protect Your Invention," containing information about patent protection and patent procedure. Along with this we will also send you an "Invention Record" form, for your use in writing down and sketching details of your invention. We will mail them promptly. No obligation. They are yours for the asking.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

PATENTS • COPYRIGHTS • PATENTS

142-Y VICTOR BUILDING, WASHINGTON 1, D. C.

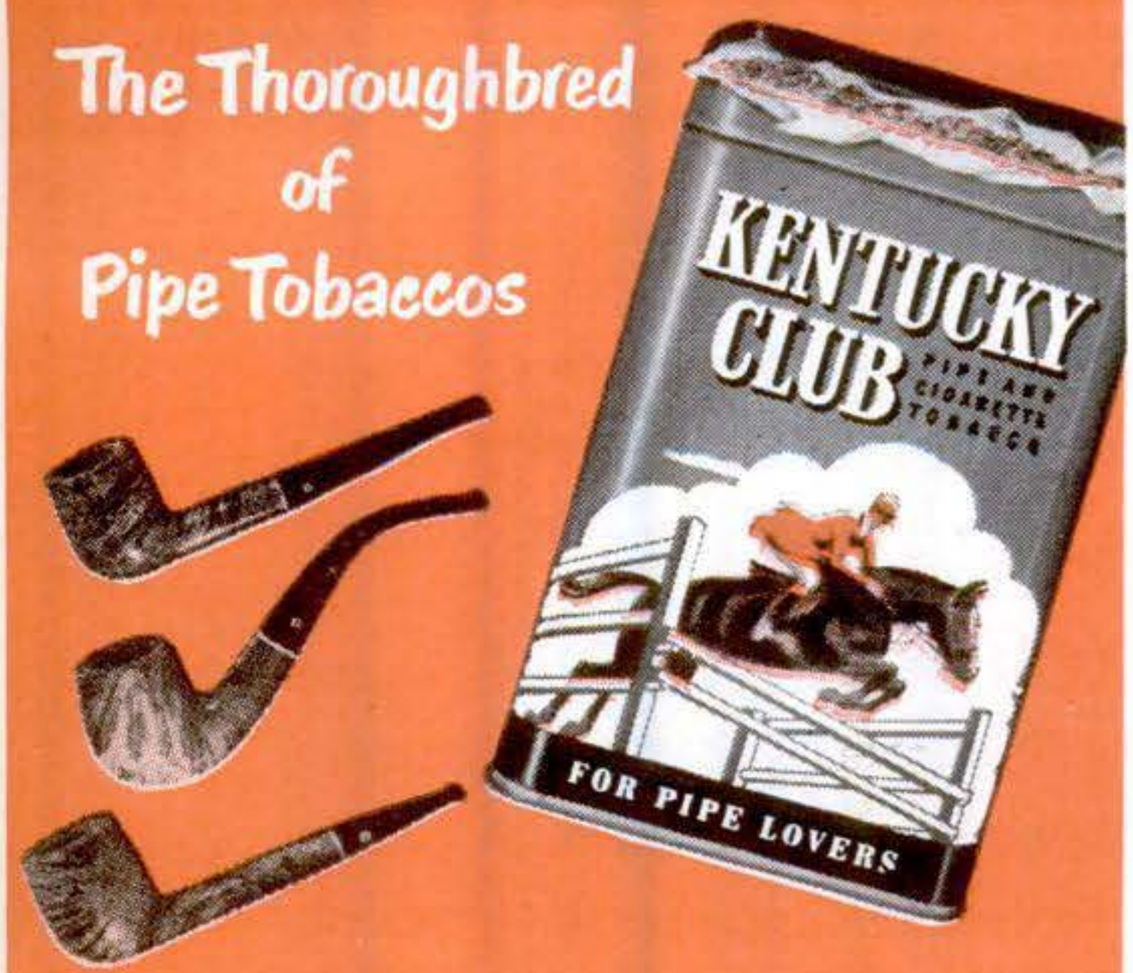
Copyrighted material

SWITCH TO

MILD

KENTUCKY CLUB

The Thoroughbred of Pipe Tobaccos



Get Fine Pipes at Worth-while Savings — You bet it pays to switch to Kentucky Club. It's the thoroughbred of pipe tobaccos—choice white Burley specially blended to give you a mild, smooth smoke with grand taste and aroma. In addition, every package of Kentucky Club contains a valuable Dividend Coupon. Save these Coupons and get your choice of fine pipes at *big savings*. Beautiful pipes of imported briar made by expert craftsmen. 14 shapes. Do these two things today. Buy your first tin of Kentucky Club. Mail coupon for free catalog.

FREE Illustrated catalog showing Kentucky Club Dividend pipes and other premiums.

Mail Pouch Tobacco Co., Dept. 51
Wheeling, West Virginia

Please send—free—Kentucky Club Catalog.

Name.....

Street.....

City.....State.....

new-car specifications. Sometimes you use the heading "Piston travel (in feet per car mile at 20 m.p.h.)."

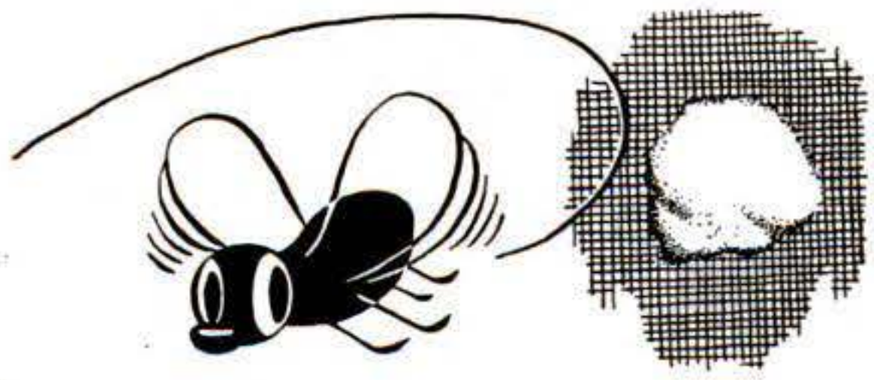
I know that piston travel per car mile in high is a useful figure to know, since it's a way to estimate the rate of engine wear and hence time between overhauls. But why in the name of good sense do you specify "at 20 m.p.h."? It doesn't make a blessed bit of difference how fast the car is going. The piston travel per mile is just the same if you're going 20 or 80.

CLARENCE HOLME, Portland, Me.

Speed makes a difference. The reason, of course, is that centrifugal force varies the effective diameter of the rear wheels. According to a test engineer for a major Detroit manufacturer, 6.00 by 16 tires have a diameter of about 27 inches at rest under normal load and inflation. To cover one mile, they must turn 747 times. But traveling at 80 m.p.h., the tires "grow" in effective diameter by 19/64 inch. Thus they can cover the same mile in only 738 turns, about nine turns less. Therefore, given a rear-axle ratio of 3.9 to 1 and an engine stroke of 4⅜ inches, a piston will travel some 25 fewer feet per mile at 80 m.p.h. than at a very low speed. That's a reduction of slightly more than one percent.

The Great Cotton Mystery

I disagree with the U. S. Bureau of Entomology's statement that a wad of cotton on



a screen door is of no use in keeping flies away [PS, Aug., p. 8]. I have found it 85 to 90 percent effective.

J. D. MACK, Encino, Calif.

. . . The flies think the cotton is a spider web and stay away.

P. H. LOGAN, Calhoun, Ga.

. . . They mistake it for a giant white moth which is their deadly enemy.

EDW. L. MEAD, University City, Mo.

. . . The Bureau apparently failed to test the cotton with DDT on it. Then it works.

F. V. SPENCE, Norwood, La.

Copyrighted material

NOW . . . GET EVERYTHING YOU NEED TO LEARN AND MASTER TELEVISION RADIO-ELECTRONICS . . . AT HOME!

Use REAL commercial-type equipment to get practical experience

Your future deserves and needs every advantage you can give it! That's why you owe it to yourself to find out about one of the most COMPLETE, practical and effective ways now available to prepare AT HOME for America's billion dollar opportunity field of TELEVISION-RADIO-ELECTRONICS. See how you may get and keep the same type of basic training equipment used in one of the nation's finest training laboratories . . . how you may get real STARTING HELP toward a good job or your own business in Television-Radio-Electronics. Mail the coupon today for complete facts — including 89 ways to earn money in this thrilling, newer field.

Here's the REAL THING!

ABOVE: Build and keep a real 16 INCH commercial TV receiver. Optional after completing regular training at slight additional cost.

SET UP YOUR OWN HOME LABORATORY

D.T.I., ALONE, INCLUDES BOTH MOVIES and HOME LABORATORY

In addition to easy-to-read lessons, you get the use of HOME MOVIES — an outstanding training advantage — plus 16 big shipments of Electronic parts. Perform over 300 fascinating experiments for practical experience. Build and keep real commercial-type test equipment shown at left.

MODERN LABORATORIES

If you prefer, get all your preparation in our new Chicago Training Laboratories—one of the finest of its kind. Ample instructors, modern equipment. Write for details!

MILITARY SERVICE!

If you're subject to military service, the information we have for you should prove doubly interesting. Mail coupon today.

Get BOTH of these information packed publications FREE!

ACT NOW! MAIL COUPON TODAY!

DeFOREST'S TRAINING, INC., Dept. PS-10-H
2533 N. Ashland Ave., Chicago 14, Ill.

Without obligation, I would like your late News-Bulletin showing 89 ways to earn money in Television-Radio-Electronics . . . and how I may prepare to get started in this thrilling field.

Name..... Age .....
Street..... Apt. .....
City..... Zone..... State.....

De FOREST'S TRAINING, INC.
CHICAGO 14, ILLINOIS
A DeVRY INSTITUTION

Copyrighted material

SECRETS ENTRUSTED TO A FEW

The Unpublished Facts of Life

THERE are some things that can not be generally told—*things you ought to know.* Great truths are dangerous to some—but factors for *personal power* and *accomplishment* in the hands of those who understand them. Behind the tales of the miracles and mysteries of the ancients, lie centuries of their secret probing into nature's laws—their amazing discoveries of *the hidden processes of man's mind,* and *the mastery of life's problems.* Once shrouded in mystery to avoid their destruction by mass fear and ignorance, these facts remain a useful heritage for the thousands of men and women who privately use them in their homes today.

THIS FREE BOOK

The Rosicrucians (not a religious organization), an age-old brotherhood of learning, have preserved this secret wisdom in their archives for centuries. *They now invite you to share the practical helpfulness of their teachings.* Write today for a free copy of the book, "The Mastery of Life." Within its pages may lie a new life of opportunity for you. Address Scribe A.G.Y.

The ROSICRUCIANS
(AMORC)
San Jose California, U.S.A.

WHOLESALE BY MAIL

GOOD USED TIRES
with a GOLD BOND GUARANTEE

Nationally Advertised Brands
FREE TUBE with each passenger tire

12 Month GOLD BOND GUARANTEE

600-16	$4.16	700-16	$5.06	700-15	$4.56	710-15	$4.96
650-16	4.66	650-15	4.46	670-15	4.76	550-17	4.66

24 Month GOLD BOND GUARANTEE

600-16	$5.56	650-18	$6.96	820-15	$7.06	825-20	$19.98
650-16	5.96	650-15	5.96	475-19	5.96	900-20	20.45
700-16	5.96	670-15	6.26	600-20	9.95	1000-20	22.50
750-16	6.96	700-15	6.56	650-20	10.75	1100-20	22.50
550-17	5.96	710-15	6.36	700-20	12.45	1000-22	19.50
525-18	5.56	760-15	6.56	750-20	13.48	1100-22	20.25

MILITARY MUD AND SNOW TIRES

12 Month GOLD BOND GUARANTEE

600-16	900-16	750-20
Special $6.50	Special $10.50	Special $10.25

24 Month GOLD BOND GUARANTEE

600-16	900-16	750-20
Special $9.50	Special $19.50	Special $18.50

ALL SIZE TRACTOR TIRE PRICES ON REQUEST

Send check or money order to

GOLD BOND TIRE COMPANY, Dept. PS 24
1501 North 2nd Street P. O. Box 2175
RICHMOND, VIRGINIA

MONEY for MEN ALL DATA FREE

THE PLASTEX Industry needs manufacturers on small scale and for big production of Lamp and Clock Stands. Art Goods and Novelties in Plastex and Marble imitation. Experience unnecessary. ½c material makes regular 10c store sellers. Rubber moulds furnished for speed production. Small investment brings good returns. We are now placing big chain store orders with manufacturers. Ambitious men have chance for real prosperity. Our Free booklet will interest and benefit you.

PLASTEX INDUSTRIES, Dept. 2, 3400 Third Ave., New York 56, N. Y.

"How to Make Money with Simple Cartoons"

A book everyone who likes to draw should have. It is free; no obligation. Simply address

FREE BOOK

CARTOONISTS' EXCHANGE
Dept. 1910-D, Pleasant Hill, Ohio

BROOKS can make a career for YOU

LEARN INVESTIGATIVE PHOTOGRAPHY

LEGAL—CRIMINAL

Securing evidence through ballistic photos, fingerprints, scenes of accidents and crimes is
INTERESTING • EXCITING • PROFITABLE

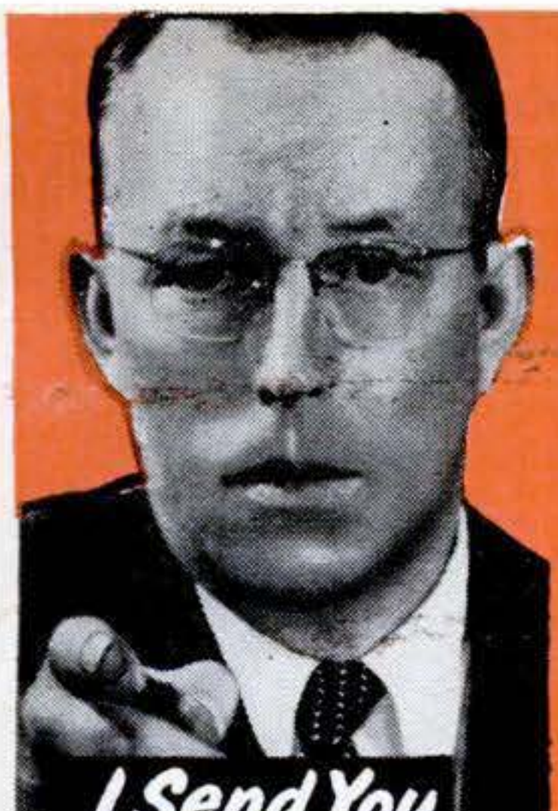
At Brooks Institute, you learn by doing. You use the finest up-to-date equipment and you're trained by instructors, each an expert in his field. Brooks is the only recognized photographic school offering this opportunity to learn legal and criminal photography.

Opportunity knocks — with the click of a shutter. Start your Investigative Career by investigating today . . . *Write for our FREE booklet and full information.*

BROOKS INSTITUTE OF PHOTOGRAPHY

SANTA BARBARA • CALIFORNIA
"PHOTOGRAPHER'S PARADISE . . . Where the mountains meet the sea."

Copyrighted material



NOW—Be a Fully Trained, Qualified RADIO TELEVISION TECHNICIAN IN JUST 10 MONTHS OR LESS!

I Send You 18 BIG KITS OF RADIO-TELEVISION EQUIPMENT

TRAIN AT HOME IN SPARE HOURS!

New "Package" Unit Training Plan—Pay As You Learn—You Set The Pace!—No Monthly Payment Contract to Sign!—Train at Home in Spare Hours!

Now . . . be ready for Radio-Television's big pay opportunities in a few short MONTHS! Frank L. Sprayberry's completely new "Package" training unit plan prepares you in just 10 MONTHS . . . or even less! There is NO monthly payment contract to sign . . . thus NO RISK to you! This is America's finest, most complete, practical training—gets you ready to handle any practical job in the booming Radio-Television industry. In just 10 months you may start your own profitable Radio-Television shop . . . or accept a good paying job. Mr. Sprayberry has trained hundreds of successful Radio-Television technicians—and stands ready to train you in less than one year, even if you have no previous experience!

Valuable Equipment Included With Training

The new Sprayberry "package" plan includes many big kits of genuine, professional Radio-Television equipment. While training, you perform over 300 demonstrations, experiments and construction projects. In addition, you build a powerful 6-tube standard and short wave radio set, a multi-range test meter, a signal generator, signal tracer, many other projects. All equipment is *yours to keep* . . . you have practically everything you need to set up your own service shop. The Sprayberry book-bound lessons and other training materials . . . all are yours to keep.

Earn Extra Money While You Learn!

All your 10 months of training is AT YOUR HOME in spare hours. Keep on with your present job and income while learning . . . and earn EXTRA CASH in addition. With each training "package" unit, you receive extra plans and ideas for spare time Radio-Television jobs. Many students pay for their entire training this way. If you expect to be in the armed forces later, there is no better preparation than good Radio-Television training.

FREE 3 BIG RADIO-TELEVISION BOOKS

I want you to have ALL the facts about my new 10-MONTH Radio-Television Training—without cost! Rush coupon for my three big Radio-Television books: "How to Make Money in Radio-Television," PLUS my new illustrated Television Bulletin PLUS an actual sample Sprayberry Lesson—all FREE. No obligation and no salesman will call. Mail coupon NOW! I will rush all three books at once!

Sprayberry Academy of Radio, Dept. 55-B
111 North Canal St. Chicago 6, Ill.

Mail Coupon Today!

NO OBLIGATION
No Salesman Will Call

SPRAYBERRY ACADEMY OF RADIO, Dept. 55-B
111 North Canal St., Chicago 6, Ill.

Please rush to me all information on your 10-MONTH Radio-Television Training Plan. I understand this does not obligate me and that no salesman will call upon me.

Name..... Age.....

Address.....

City..... Zone.... State.....

Please Check Below About Your Experience

☐ Are You Experienced? ☐ No Experience

IF YOU ARE EXPERIENCED IN RADIO

Men already in Radio who seek a short intensive 100% TELEVISION Training with FULL EQUIPMENT INCLUDED are invited to check and mail the coupon at the right.

Copyrighted material

To skilled men:

LOCKHEED

in California

offers you a top

JOB IN AIRCRAFT

with generous travel allowances for moving expenses

Lockheed is building planes for defense, planes for the world's airlines. It's all part of our long-range production program—a program that means a better job, better future, a better life for you in California.

Lockheed needs:

Machinists
Tooling Men
Engineers

Experience in aircraft production is not needed; your skill can be adapted to Lockheed's type of work.

Lockheed offers you: Top wages, travel allowances to be paid after six months employment at Lockheed, retirement plan, group insurance and many other benefits, regular job ratings for promotion.

Middle-age is no barrier to a job at Lockheed; skill and ability, not years, count here.

Note to Men with Families:

Housing conditions are excellent in the San Fernando Valley, the home of Lockheed. Huge tracts are under construction. Thousands of homes have been built since World War II. The school system is splendid.

Write today for job application blank, illustrated brochure describing life and work at Lockheed in California, and full details on your opportunity at Lockheed. State your type of work. Use handy coupon below.

M. V. MATTSON, Employment Manager
LOCKHEED AIRCRAFT CORP., Dept. P 10, Burbank, Calif.

My Name

My Type of Work

My Street Address

My City and State

Famous 15 and 17 Jewel

BULOVA WATCHES $16.95 PLUS TAX

PRACTICALLY WHOLESALE TO YOU

LIFETIME WRITTEN GUARANTEE

WERE UP TO $59.50 SAVE $42.55

ALSO FAMOUS
- BENRUS
- GRUEN
- WALTHAM or ELGIN Watches

Now you can save up to $42.55 on a genuine Bulova, Benrus, Gruen, Waltham, Elgin or other famous make wrist watches, in the latest style Yellow Gold case. You get these unredeemed LIFETIME GUARANTEED watches at this sensationally low price because we bought out SURPLUS STOCKS of leading New York and Md. jewelers. Order now while they last! Specify make preferred and whether men's or ladies'. Only $16.95 plus $1.70 tax.

10 DAY TRIAL OFFER! WEAR AT OUR RISK!

Wear any of our guaranteed watches for 10 DAYS FREE TRIAL! If not delighted, full refund will be made at once!

FREE Handsome expansion band included FREE with your order! Send ONLY $1 down payment—pay balance to postman plus postage on arrival. Or enclose full payment plus tax with order and we pay postage.

MARYLAND DISTRIBUTORS, Dept. 297
501 East Baltimore Street Baltimore 2, Md.

WRITE FOR FREE WATCH AND DIAMOND RING CATALOG—PRACTICALLY WHOLESALE PRICES.

Wheels Wheels

Wheels Wheels

5" Disc Wheel 5/8" Tire 5/16" or 3/8" sleeve.....30c ea.
6" Disc Wheel 5/8" Tire 5/16" or 3/8" sleeve.....35c ea.
7" Disc Wheel 3/4" Tire 3/8" sleeve.....45c ea.
8" Disc Wheel 1 1/8" Tire 1/2" sleeve.....70c ea.
7" Disc Wheel 1" Tire 1/2" ball bearing.....80c ea.
8" Disc Wheel 1 1/8" Tire 1/2" ball bearing.....$1.00 ea.
8" Disc Wheel 2" semi-pneum. T. 1/2" B.B.....$1.35 ea.
10" Disc Wheel 1.75 semi-pneum. T. 1/2" B.B.....$1.50 ea.
12" Disc Wheel 1.75 semi-pneum. T. 1/2" B.B.....$1.85 ea.

Above wheel prices includes hub cap.
Plus Postage, 20%. C.O.D.'s accepted.

UNITED WHEEL STAMPING CO.
12131 S. PEORIA STREET PS-10 CHICAGO 43, ILLINOIS

TASOPE PHOTO-ENGRAVING PLANTS

MATERIAL COST OF THIS CUT 3/4¢ SELLING PRICE $1.00 AND UP

Establish your own profitable PHOTO-ENGRAVING business. Make cuts for newspapers printers, and advertisers. Make etched name plates, plaques etc. Instructions furnished, no experience necessary. Sold direct from factory since 1931. First five hundred cuts sold locally or by mail will pay for plant and pay you well for your time. Write for FREE catalog.

TASOPÉ DEPT. PS-10, AURORA, MO.

Develop Hidden Earning Power

STUDY LAW

at home! LL.B. Degree

Qualify yourself in spare time for advancement, greater earnings, business success. Now, more than ever, legal ability is in demand! Easy-to-understand step-by-step lessons and text material furnished—invaluable for permanent reference. 42 years expert teaching. 114,000 students enrolled. Easy payments. Find out now, at no cost, how study of law can help you. Write today for FREE Book "Law and Executive Guidance."

AMERICAN EXTENSION SCHOOL OF LAW
Dept. PS-43 646 N. Michigan Ave. Chicago, Ill.

Copyrighted material

WILL YOU BE CLIMBING? OR STUCK?

WHAT you'll be doing *one year* from today depends on what you do *today*.

Take advantage of today's opportunities and you're sure to move ahead. Put off doing anything about them and you chance being left behind.

The opportunities open to trained men are greater today than at any time in the past five years. Skilled technicians and specialists are the *men of the hour*. And thousands of them are I. C. S. students.

Start now! Study at home, in your spare time, with the world's largest school—I. C. S. Mail the coupon today for full information. It may be later than you think!

INTERNATIONAL CORRESPONDENCE SCHOOLS

60th Anniversary

BOX 7690-M, SCRANTON 9, PENNA.

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

Business and Academic Courses
- ☐ Accounting ☐ Advertising
- ☐ Bookkeeping
- ☐ Business Administration
- ☐ Business Correspondence
- ☐ Business Law
- ☐ Cartooning
- ☐ Certified Public Accounting
- ☐ Commercial ☐ Commercial Art
- ☐ Cost Accounting
- ☐ Fashion and Book Illustration
- ☐ Federal Tax ☐ First Year College
- ☐ Foremanship
- ☐ Good English ☐ High School
- ☐ Higher Mathematics
- ☐ Industrial Supervision
- ☐ Motor Traffic
- ☐ Personnel—Labor Relations
- ☐ Postal Civil Service ☐ Retailing
- ☐ Retail Business Management
- ☐ Salesmanship ☐ Secretarial
- ☐ Sign Lettering
- ☐ Stenography ☐ Traffic Management

Aeronautics Courses
- ☐ Aeronautical Engineer's, Jr.
- ☐ Aircraft Drafting and Design
- ☐ Aircraft Mechanic
- ☐ Engine Mechanic

Air Conditioning and Plumbing Courses
- ☐ Air Conditioning ☐ Heating
- ☐ Plumbing
- ☐ Refrigeration
- ☐ Refrigeration, Domestic
- ☐ Refrigeration & Air Conditioning
- ☐ Steam Fitting

Chemical Courses
- ☐ Chemical Engineering
- ☐ Chemistry, Analytical
- ☐ Chemistry, Industrial
- ☐ Food-Plant Sanitation
- ☐ Petroleum Production & Refining
- ☐ Plastics ☐ Pulp and Paper Making

Civil Engineering and Architectural Courses
- ☐ Architecture ☐ Architectural Drafting
- ☐ Bridge and Building Foreman
- ☐ Building Estimating
- ☐ Civil Engineering
- ☐ Contracting and Building
- ☐ Highway Engineering
- ☐ Reading Structural Blueprints
- ☐ Sanitary Engineering
- ☐ Structural Drafting
- ☐ Structural Engineering
- ☐ Surveying and Mapping

Communications Courses
- ☐ Electronics ☐ Practical Telephony
- ☐ Radio, General ☐ Radio Operating
- ☐ Radio Servicing
- ☐ Television
- ☐ Telegraph Engineering

Electrical Courses
- ☐ Electrical Drafting
- ☐ Electrical Engineering
- ☐ Electric Light and Power
- ☐ Lighting Technician
- ☐ Practical Electrician
- ☐ Power House Electric
- ☐ Ship Electrician

Diesel Engines Courses
- ☐ Diesel Engines
- ☐ Internal Combustion Engines

Mechanical Courses
- ☐ Forging ☐ Foundry Work
- ☐ Heat Treatment of Metals
- ☐ Industrial Engineering
- ☐ Industrial Instrumentation
- ☐ Industrial Metallurgy
- ☐ Machine Shop ☐ Mechanical Drafting
- ☐ Mechanical Engineering
- ☐ Mold-Loft Work
- ☐ Patternmaking—Wood, Metal
- ☐ Reading Shop Blueprints
- ☐ Sheet-Metal Drafting
- ☐ Sheet-Metal Worker
- ☐ Ship Drafting ☐ Ship Fitting
- ☐ Tool Designing ☐ Toolmaking
- ☐ Welding—Gas and Electric

Railroad Courses
- ☐ Air Brake ☐ Car Inspector
- ☐ Diesel Locomotive
- ☐ Locomotive Engineer
- ☐ Locomotive Fireman
- ☐ Locomotive Machinist
- ☐ Railroad Section Foreman
- ☐ Steam-Diesel Locomotive Engineer

Stationary Engineering Courses
- ☐ Power Plant Engineering
- ☐ Stationary Fireman
- ☐ Stationary Steam Engineering

Textile Courses
- ☐ Cotton Manufacturing
- ☐ Loom Fixing ☐ Rayon Manufacturing
- ☐ Textile Engineering
- ☐ Woolen Manufacturing

Name_____ Age_____ Home Address_____

City_____ State_____ Working Hours_____ A.M. to_____ P.M.

Present Position_____ Employed by_____

Special tuition rates to members of the Armed Forces. Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.

Copyrighted material

SCHICK INJECTOR WINS 5 TO 1 IN U.S. SHAVING TESTS*

USES FAMOUS "GOLD PACK" BLADES THAT GIVE FINER SHAVES THAN ALL OTHERS —INCLUDING OUR OWN OLD BLADES!

Either you get the finest shaves of your life —or your money back, quick!

WORLD'S ONLY RAZOR with all these big advantages:

Blades change *automatically*—"lock" at same, precise angle—no adjusting . . .

Light weight makes shaving easier! Safety-Bar smooths down skin . . . "Fits" face—around nose, lips . . . Uses new "Gold Pack" Blades!

***HERE'S FULL SCORE FROM SHAVING TESTS**

Smoother Shaves 5½ to 1 Safer Shaves 7 to 1
Cleaner Shaves 5 to 1 Faster Shaves 5 to 1
More Shaves per blade, nearly 2 to 1

*Men in 10 cities—nationwide—compared New Schick Injector Razor and "Gold Pack" Blades with whatever they had been using. About 80% of the men had a preference. Of these, the votes were in the ratios shown above. ©1951 Eversharp Inc., 350 5th Ave., N. Y. C.

SCHICK INJECTOR

RAZOR and BLADES

INVENTORS

Before you make any effort to market your invention, you should take the first steps toward proceeding for patent protection.

I shall be pleased to furnish you with information relative to patent procedure upon request from you, and this will be without any obligation on your part.

PATRICK D. BEAVERS
Registered Patent Attorney
937 Columbian Building, Washington 1, D. C.

INVENTORS

Send today for "Patent Protection for Inventors" outlining preliminary steps to take toward patent protection, also convenient "Evidence of Invention" Form.

VICTOR J. EVANS & CO.
640-L Merlin Building • Washington 6, D.C.

PATENTS PATENT LAWYER

GUSTAVE MILLER
REGISTERED PATENT ATTORNEY
PS-101 WARNER BUILDING
WASHINGTON 4, D. C.

ASSOCIATE EXAMINER
U. S. PATENT OFFICE 1922-1929
PATENT ATTORNEY & ADVISOR
U. S. NAVY DEPT. 1930-1947
Send for PATENT INFORMATION Book and "INVENTOR'S RECORD" without obligation.

PATENTS

C. A. SNOW & CO.
REGISTERED PATENT ATTORNEYS
WRITE FOR INFORMATION TO
426 SNOW BUILDING, WASHINGTON 1, D. C.

INVENTORS

Whether an invention is patentable can be substantially determined by a search of the U. S. Patent records. Without obligation, write for information explaining the steps you should take to secure a patent.

JOHN N. RANDOLPH
Registered Patent Attorney
205 Columbian Building Washington 1, D. C.

INVENTORS

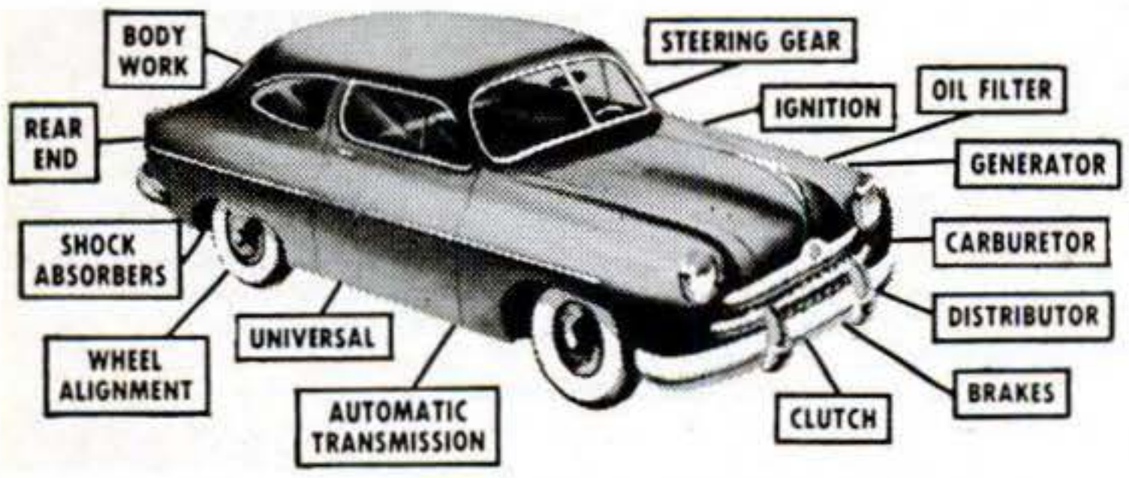
IF YOU WISH TO PROTECT YOUR INVENTION, You should take steps to protect it by a U. S. Patent. Write me for "INVENTION RECORD" FORM

CARL MILLER
REGISTERED PATENT ATTORNEY
WOOLWORTH BLDG., 35th FLOOR, 101C
NEW YORK CITY

Copyrighted material

I NEVER DREAMED THAT Fixing Cars COULD BE A PUSHOVER!

Now ANY Auto Repair Job is a "Cinch" for You—Whether You're an Experienced Mechanic or a "Green Beginner"!



MOTOR'S New AUTO REPAIR MANUAL Shows You Step-by-Step How to Fix ANY Part of ANY Car Built From 1935 to 1951

YES, it's as easy as A-B-C to do *any* "fix-it" job on *any* car — whether it's a simple carburetor adjustment or a complete overhaul. Just check the index of MOTOR'S New AUTO REPAIR MANUAL. Turn to pages covering job. Follow the clear, illustrated step-by-step instructions. Presto—the job is done!

"I fixed a motor in 30 minutes after another mechanic had worked on it half a day." — C. AUBERRY, Murfreesboro, Tenn.

No guesswork! MOTOR'S Manual takes nothing for granted. Tells you where to start. What tools to use. Leads you easily and quickly through the entire operation!

Over TWO THOUSAND Pictures!

NEW REVISED 1951 Edition covers everything you need to know to repair 800 car models. 771 giant pages, 2300 "This-Is-How" pictures.

Over 200 "Quick-Check" charts—more than 38,000 essential repair facts. Instructions and pictures are so clear you *can't* go wrong!

Even a green beginner mechanic can do a good job with this giant manual before him. If you're a top-notch mechanic, you'll find efficient shop methods that will amaze you. No wonder this guide is used by the U. S. Army, Navy, and hundreds of thousands of repair men!

Meat of Over 150 Official Shop Manuals

Engineers from every auto plant in America worked out these time-saving procedures for their own car line. Now MOTOR brings you this wealth of "know-how" from over 150 Official Shop Manuals, "boiled down" into crystal-clear terms, profusely illustrated, in one handy indexed book!

Covers 800 Models

Buick, Cadillac, Chevrolet, Chrysler, Crosley, De Soto, Dodge, Ford, Frazer, Henry J, Hudson, Kaiser, Lafayette, La Salle, Lincoln, Mercury, Nash, Nash Rambler, Oldsmobile, Packard, Plymouth, Pontiac, Studebaker, Terraplane, Willys. ALSO tune-up adjustments for others

BRAND NEW EDITION! USED BY U. S. ARMY AND NAVY

SEND NO MONEY

When postman brings book pay him nothing. First, make it show you what it's got! Unless you agree this is the greatest time-saver and work-saver you've ever seen—return book in 7 days and pay nothing. Mail coupon *NOW!* **MOTOR Book Dept., Desk 210, 250 W. 55th St., New York 19, N. Y.**

Same FREE 7-Day Offer On MOTOR'S Newest TRUCK & TRACTOR REPAIR MANUAL

For mechanics, truck specialists, service stations, fleet owners. Covers EVERY job on EVERY popular make gasoline truck or farm tractor from 1936 thru 1951! Over 1400 pictures, 925 pages, 300,000 facts. Used by Armed Forces. For FREE 7-DAY Trial, check proper box in coupon.

"MOTOR'S Manual paid for itself on the first 2 jobs, and saved me valuable time by eliminating guesswork."—W. SCHROP, Ohio.

MAIL COUPON NOW FOR 7-DAY FREE TRIAL

MOTOR Book Dept., Desk 210
250 West 55th Street, New York 19, N. Y.

Rush to me at once: (Check box opposite book you want)

☐ **MOTOR'S New AUTO REPAIR MANUAL.** If O.K. I will remit $1 in 7 days, (plus 35c delivery charge—then $2 monthly for 2 months, and a final payment of 95c a month later. Otherwise I will return book postpaid in 7 days. (Foreign price, remit $8 cash with order.)

☐ **MOTOR'S New TRUCK & TRACTOR REPAIR MANUAL.** (Described at left). If O.K. I will remit $2 in 7 days, and $2 monthly for 3 months, plus 35c delivery charge with final payment. Otherwise I will return book promptly. (Foreign price, remit $10 cash with order.)

Print Name..... Age.....

Print Address.....

City & Zone No.....State.....

☐ **SAVE 35c** delivery charges by enclosing WITH COUPON check or money order for full payment of $5.95 for Auto Manual (or $8.00 for Truck Manual). Same 7-day return-refund privilege applies.

Copyrighted material

WE TRAIN YOU AT HOME FOR

RADIO TELEVISION JOBS

EARN UP TO $50 A WEEK IN SPARE TIME

TV-Radio-FM Service Technicians in Big Demand! Get top pay faster through RTTA practical shop-training methods right in your own home. We supply everything.

EARN WHILE YOU LEARN!

YOU KEEP ALL EQUIPMENT

RTTA Furnishes Everything! Tubes, Batteries, Large TV Picture Tube!

YOU BUILD AND KEEP THIS GIANT SCREEN TELEVISION SET!

Your choice of 10, 12½ or 16" Picture Television Tube

WE PREPARE YOU FOR FCC LICENSE! U. S. GOV'T. NEEDS FCC MEN

MULTITESTER

SIGNAL GENERATOR

5-TUBE RADIO

YOU GET 15 BIG TELEVISION RADIO KITS AT NO EXTRA COST! YOU BUILD THESE AND FOUR OTHER UNITS

FREE At No Extra Cost YOU GET A ROUND TRIP TO NEW YORK CITY

After completing home study training, your transportation both ways from any point in U. S. or Canada will be paid by RTTA. You visit our affiliated facilities in N.Y.C. as part of your 2 weeks of practical training on newest equipment at RTTA.

NO PREVIOUS EXPERIENCE NECESSARY

FREE EMPLOYMENT HELP

RTTA helps you earn while you learn! Open to men of all ages! RTTA prepares you for BIG PAY and to open your own shop.

DRAFT AGE MEN

Special "SPEED-UP" Radio Technician program helps you get BETTER SERVICE RATING—BETTER PAY! You can find out by return mail! Send Coupon TODAY!

FREE "SPEED-UP" OFFER—COUPON

BOTH FREE

Radio Television Training Association
515 Clinton Ave., Dept. 1510. Newark 1, N. J.

Rush me FREE Sample Lesson and Catalog "How to Make Money in Television," in spare time, AT HOME, while learning. Also "Speed-Up" Service Rating Plan. I'm under no obligation.

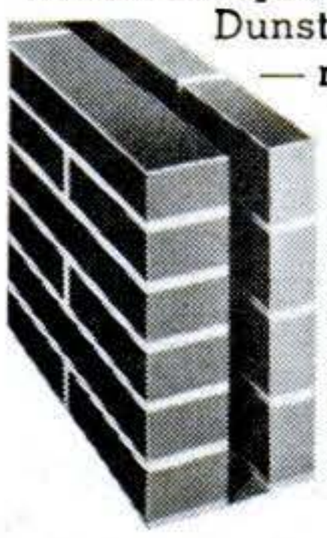
Name.....Age....

Address.....

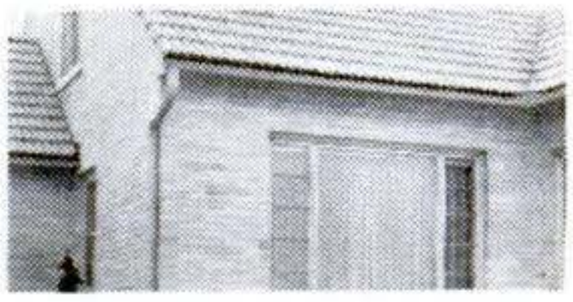
Approved by Commissioner of Education of State of N. J.

More Local Plants Needed to Supply Growing Demand

More local plants are badly needed to make Dunbrik-Dunstone — America's finest masonry. Smart — modern — colorful. Yet costs less than lumber. Millions used annually for homes, stores, factories, public buildings, etc.



Write for portfolio "Blueprints for Profit"



With Dunbrik-Dunstone you can ride the tide of the biggest building cycle in history. Local plant — local materials — local labor. Equipment costs moderate. Liberal sponsor co-operation. 100%—150% mark-up on basic costs. Outstanding manufacturing opportunity for men of vision and responsibility. Write at once.

DUNBRIK-DUNSTONE

W. E. DUNN MFG. CO.
630 W. 24th St., Holland, Mich.

BECOME AN EXPERT IN

TRAFFIC

Traffic men earn $4,000 to $10,000 and up. Thousands of firms need experts on rates, tariffs, regulations. We train you thoroly in spare time at home for executive traffic jobs. Personal training under traffic authorities. Placement counsel and help. Write for free 48-page book "Traffic Management—the Fast Growing Profession."

LASALLE Extension University, 417 So. Dearborn St.
A Correspondence Institution, Dept. 1083T Chicago 5, Ill.

MASTER COURSE IN

HYPNOTISM

SECRETS REVEALED!
Actual methods, techniques of master hypnotists . . . how to hypnotize suitable subjects at a glance — a command — by phone! How to control subjects *after* they awaken—help break tobacco, other habits. Self-hypnosis. Group hypnosis. Entertain with amazing hypnotic stunts for *fun or profit*. Get this easy-to-understand, how-to-do-it course *now! Money-back guarantee.* Fully **photo-illustrated . . . $2 (complete).** **EXTRA!** Unique "ALARM-CLOCK MIND" instruction folio and **Hypnotic Catalog No. 2** included. Order "Hypnotism Course" *today!*

Complete $2

POWER PUBLISHERS, Dept. PS7, 790 Broad St., Newark, N. J.

new, easy way to.. STRIPE with PAINT

Do Perfect Paint Striping at Home with New Kind of

PAINT STRIPING TOOL

This Master Painters' **Striping Tool** makes it easy to do expert striping on furniture, bikes, model planes, autos, signs, toys, linoleum, wall board, etc. Makes plain, painted walls look like tile. Paint straight lines . . . curved . . . circular or evenly spaced parallel lines the same way a professional painter does. Simply fill Tubular-Glass Paint Fountain with any color paint and wheel tip feeds paint evenly. Tips interchangeable—jaws split apart for easy cleaning. Tool complete with tips for 1-16 in. stripe only $1.00 postpaid. Other complete tools with 1-64, 1-32, 3-64, 5-64, 3-32, 1-8 inch tips, $1.50 ea. Extra tips — 75c each. **COMPLETE KIT** with tool and 7 tips, $5.00. Here's the handiest tool in your whole painter's kit. C.O.D.'s post. coll.

DEALERS
Paint Striping Tool
packed in attractive display cartons of 1 doz. Fast, profitable seller. Write for illus. circular, discounts.

ONLY $1 POSTPAID

ATTENTION Home Craftsmen and Hobbyists

Just the tool you've been waiting for! New PAINT STRIPING tool gives "professional" results every time, yet simple and easy to use as a fountain pen. Adjustable guide keeps lines straight as an arrow. Just as easy to make curves or free hand designs. Adds new beauty and finished look to everything you paint. Send dollar today.

WENDELL MFG. CO., 4234 N. Lincoln Ave., Dept. 210, Chicago 18, Ill.

Artists MAKE MONEY

Do you like to draw? Send name, address, age and occupation for FREE ART TEST, to find out your ability.

ART INSTRUCTION, Inc.
10141 ART INSTRUCTION BLDG., MINNEAPOLIS 15, MINNESOTA

IMPROVE YOUR PLAYING

PIANISTS

Greatly improve technic, sightreading, accuracy, memorizing through remarkable Mental-Muscular Co-ordination. Quick results. Practice effort minimized. Used by famous pianists, teachers, schools, students throughout U.S. and in 32 foreign countries. . . . Also complete classical or modern popular piano courses . . . Harmony, composition, arranging, songwriting studies. Unique, practical, easy to apply methods insure success **(our 25th year)**, worthwhile achievement, rapid progress.

Adults write today for FREE booklet

BROADWELL STUDIOS Dept. 9K, 2461 Amherst Ave., Los Angeles 64, Calif.

Copyrighted material

WHAT Every AUTO MECHANIC Wants to Know

A motor vehicle is a machine of many parts, each part designed and constructed for its own special function.
All good mechanics, like good doctors, should know the working theory and operation of each part and understand what causes trouble and how to remedy it.

LET AUDELS AUTO GUIDE SOLVE YOUR PROBLEMS

Every auto mechanic, helper, serviceman and operator can use a copy of AUDELS AUTOMOBILE GUIDE. The information it gives saves time, money and worry. Highly indorsed by all users. It presents the whole subject of auto mechanics from A to Z in plain language and simple terms.
This Big Practical Book gives full information with working diagrams covering the principles, construction, ignition, service and repair of modern cars, trucks and buses.
A complete Guide of 1800 pages, with over 1500 illustrations showing inside views of the working parts, with instructions for service jobs. **Diesel engines, Fluid and Hydra-matic drives fully explained.**

IT PAYS TO KNOW HOW TO

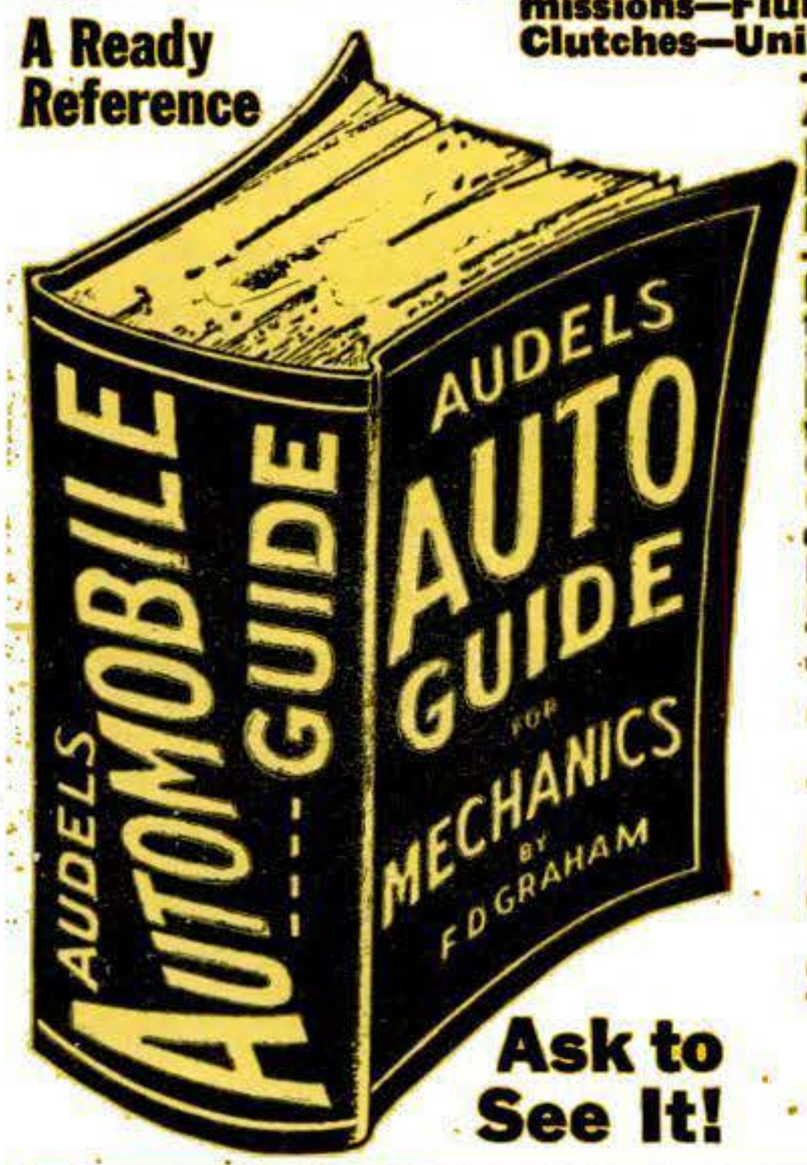
How to fit pistons—How to locate engine knocks—How to fit connecting rod bearings—How to service main bearings—How to recondition valves—How to time valves—How to adjust fan belts—How to adjust carburetors & chokes—How to rebuild a clutch—How to service automatic transmissions—How to service brakes—How to adjust steering gear—How to cope with ignition troubles—How to service distributors—How to time ignition—How to "tune up" an engine.

INFORMATION IN A HANDY FORM

73 INTERESTING CHAPTERS—*Read this partial list of subjects on which practical information is fully given for quick reference under the headings as shown below. Ready Reference Index.*

All Parts of an Automobile—Automotive Physics—The Gas Engine—Gas Engine Principles—Multi-Cylinder Engines—Horse Power—Automobile Engines—Stationary Parts—Moving Parts—Pistons—Piston Rings—Connecting Rods—Crank Shafts—Valves—Valve Gear—Cams and Cam Action—Valve Timing—Cooling Systems—Fuel Feed Systems—Dual Fuel Feed—Mixture—Carburetors—Carburetor Service—Automatic Choke—Super-Chargers—Transmissions—Special Transmissions—Fluid and Hydra-matic Drives—Clutches—Universals and Propeller Shafts—The Differential—Rear Axles—Rear and Front Suspension—Running Gear—Brakes—Wheel Alignment—Knee Action—Steering Gear—Tires—Lubricants and Lubrication—Automotive Electricity—Ignition Systems—Magneto Ignition—Spark Plugs—Ignition Coils—Distributors—Automatic Spark Control—Ignition Timing—Generators—Starters—Generator and Starter Testing—Lighting Systems—Storage Batteries—Charging and Testing—Diesel Engines and Trouble Shooting.

A Ready Reference



Ask to See It!

7 DAYS' FREE TRIAL

TO GET THIS ASSISTANCE FOR YOURSELF SIMPLY FILL IN AND MAIL COUPON TODAY.

$4 COMPLETE PAY ONLY $1 A MO.

AUDEL, Publishers, 49 W. 23 St., New York 10, N.Y.

Sent on 7 Days Approval

Step up your own skill with the facts and figures of your trade. Audels Mechanics Guides contain Practical Inside Trade Information in a handy form. Fully illustrated and Easy to Understand.
Highly Endorsed. Check the book you want for 7 DAYS FREE EXAMINATION.
Send No Money. Nothing to pay postman.

CUT HERE

MAIL ORDER

AUDEL, Publishers, 49 W. 23 St., NEW YORK 10, N. Y.

Please send me postpaid for FREE EXAMINATION books marked (x) below. If I decide to keep them I agree to mail $1 in 7 Days on each book or set ordered and further mail $1 monthly on each book or set until I have paid price, otherwise I will return them.

- ☐ TRUCK & TRACTOR GUIDE, 1299 Pages . . . $ 4
- ☐ AUTOMOBILE MECHANICS GUIDE, 1800 Pages 4
- ☐ DIESEL ENGINE MANUAL, 575 Pages 2
- ☐ MACHINISTS HANDY BOOK, 1650 Pages . . . 4
- ☐ WELDERS GUIDE, 400 Pages 1
- ☐ BLUE PRINT READING, 416 Pages 2
- ☐ MATHEMATICS & CALCULATIONS, 700 Pages. 2
- ☐ SHEET METAL PATTERN LAYOUTS, 1100 Pages 4
- ☐ SHEET METAL WORKERS HANDY BOOK, 388 Pgs. 1
- ☐ MECHANICAL DRAWING GUIDE, 160 Pages . . 1
- ☐ MECHANICAL DRAWING & DESIGN, 480 Pages 2
- ☐ AIRCRAFT WORKER, 240 Pages 1
- ☐ TELEVISION SERVICE MANUAL, 384 Pages . . 2
- ☐ RADIOMANS GUIDE, 914 Pages 4
- ☐ ELECTRONIC DEVICES, 216 Pages 2
- ☐ ELECTRIC MOTOR GUIDE, 1000 Pages 4
- ☐ ELECTRIC WIRING DIAGRAMS, 272 Pages . . 1
- ☐ ELECTRICIANS EXAMINATIONS, 250 Pages. . 1
- ☐ ELECTRIC POWER CALCULATIONS, 425 Pages. 2
- ☐ HANDY BOOK OF ELECTRICITY, 1440 Pages. . 4
- ☐ ELECTRIC DICTIONARY, 9000 Terms 2
- ☐ ELECTRIC LIBRARY, 7000 Pages (12 Book Set) 18
- ☐ MARINE ENGINEERS HANDY BOOK, 1258 Pgs. 4
- ☐ SHIPFITTERS HANDY BOOK, 250 Pages . . . 1
- ☐ REFRIGERATION & Air Conditioning, 1280 Pgs. 4
- ☐ MILLWRIGHTS & MECHANICS GUIDE, 1200 Pgs. 4
- ☐ POWER PLANT ENGINEERS GUIDE, 1500 Pages 4
- ☐ ENGINEERS & FIREMANS EXAMS, 525 Pages . 1
- ☐ PUMPS, Hydraulics & Air Compressors, 1658 Pgs. 4
- ☐ ENGINEERS LIBRARY (3 Book Set) 9
- ☐ MECHANICAL DICTIONARY, 950 Pages 4
- ☐ GARDENERS & GROWERS GUIDES (4 Book Set) 6
- ☐ CARPENTERS & BUILDERS GUIDES (4 Book Set) 6
- ☐ PLUMBERS & Steamfitters Guides (4 Book Set) 6
- ☐ MASONS AND BUILDERS GUIDES (4 Book Set) 6
- ☐ PAINTERS & DECORATORS MANUAL, 450 Pgs. 2
- ☐ HOUSE HEATING GUIDE, 1000 Pages 4
- ☐ OIL BURNER GUIDE, 384 Pages 1

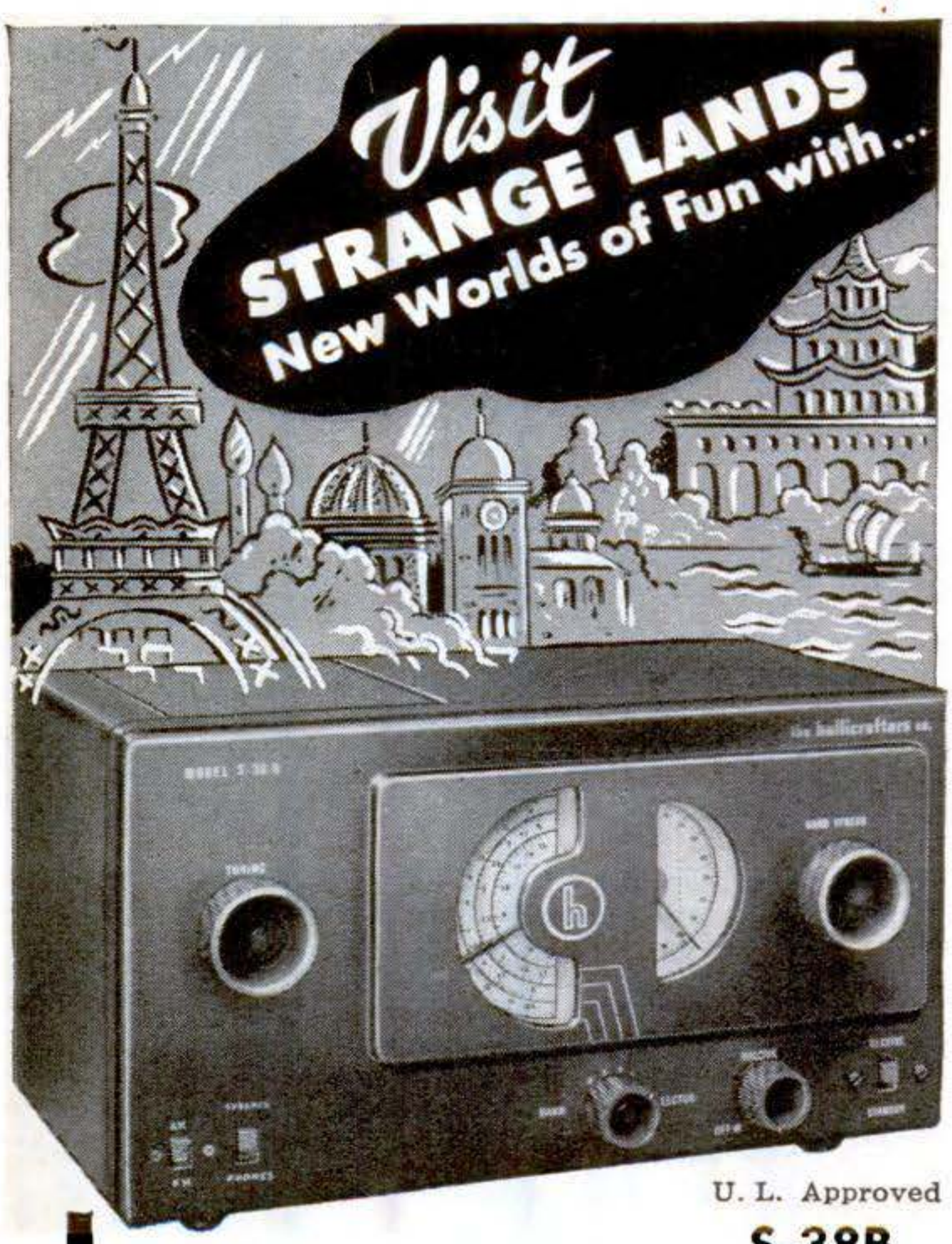
Name . . . . . .

Address . . . . . .

Occupation . . . . . .

Employed by 11

Copyrighted material



U. L. Approved

S-38B

hallicrafters

international long-range *Radio*

Enjoy the thrills of hearing news *direct* from all over the world! You can even penetrate the "Iron Curtain." And listen in on the fascinating conversations of "Ham" radio hobbyists. In addition to standard broadcasts, you can...

- **HEAR POLICE COMMUNICATIONS!**
- **TUNE IN ON AIRPLANE COMMUNICATIONS!**
- **HALLICRAFTERS** is the radio for YOU, ideal for remotely-located homes, farms, camps, suburbs or cities where good reception is ordinarily difficult.

THE POWERFUL S-38B has continuous coverage of three bands, from 540 kc to 32 Mc. In handsome steel cabinet designed by Raymond Loewy—and precision-engineered throughout as only Hallicrafters can build a radio.

AC-DC PRICE: **$49.50**

HALLICRAFTERS—WORLD'S LEADING MANUFACTURER OF PRECISION RADIO AND TELEVISION

MAIL THIS COUPON!

Hallicrafters—Dept. PS, Chicago 24, Illinois

Due to the national emergency only a limited number of these sets are being made. Reserve your S-38B now; mail coupon for name of distributor who can serve you directly. THIS RESERVATION WILL BE HELD FOR 30 DAYS AT YOUR DISTRIBUTOR. Should you not buy within that period of time the set will be given to the next name on the list. We will also send you free brochure giving full specifications.

YOUR NAME.....

ADDRESS.....

CITY..... ZONE..... STATE.....

951

CARVE LEATHER

Easy to Learn in Spare Time. Fascinating, Profitable HOBBY.

Have fun and make money too! Carve handsome bags, billfolds, belts, moccasins, key cases, etc. from our huge and varied stock of Leather Projects that come READY TO CARVE AND ASSEMBLE. To select what you need, write for complete, fully-illustrated catalog. Contains over 200 photographs of projects, leathers, tools and accessories. Learn this fascinating hobby—start small and experiment. Write for catalog today, include 25c to cover printing and mailing.

BURTONS LEATHERCRAFT
Dept. PS-10
1755½ Glendale Blvd.
Los Angeles 26, Calif.

WRITE NOW FOR COMPLETE LEATHER-CRAFT CATALOG!

A "GOOD HAND" HELPS YOU SUCCEED!

LEARN TO WRITE WELL

Your Name *beautifully written, plus special pen-point for shaded writing,* *Only 10¢*

OUR 53rd YEAR

Handwriting quickly improves with our easy-to-understand picture lessons! Put your spare time to good use; send today for ☐ FREE BOOK, "How to Become a Good Penman", or check volumes wanted below at $1 each: ☐ Business Writing ☐ Artistic Writing ☐ Card Writing ☐ Bird & Design Flourishing ☐ Engrossing Alphabets. COMPLETE SET $4.50

TAMBLYN SCHOOL of PENMANSHIP
S. A. Ziller, Pres. 438 Ridge Bldg., Kansas City, Mo., USA

High School Course at Home

Many Finish in 2 Years

Go as rapidly as your time and abilities permit. Course equivalent to resident school work — prepares for college entrance exams. Standard H. S. texts supplied. Diploma. Credit for H. S. subjects already completed. Single subjects if desired. High school education is very important for advancement in business and industry and socially. Don't be handicapped all your life. Be a High School graduate. Start your training now. Free Bulletin on request. No obligation.

American School, Dept. H-746 Drexel at 58th, Chicago 37

Watch Repairing Pays Big Money

Learn at home

Watchmakers in great demand. Train step-by-step under experts. We furnish all tools and 15 jewel watch and practice movement. Turn spare time into cash. 10 easy lessons. A licensed school. Low cost. Send for FREE book today.

ILLINOIS SCHOOL OF WATCH REPAIRING
2870 Elston Ave., Dept. PS10, Chicago 18, Ill.

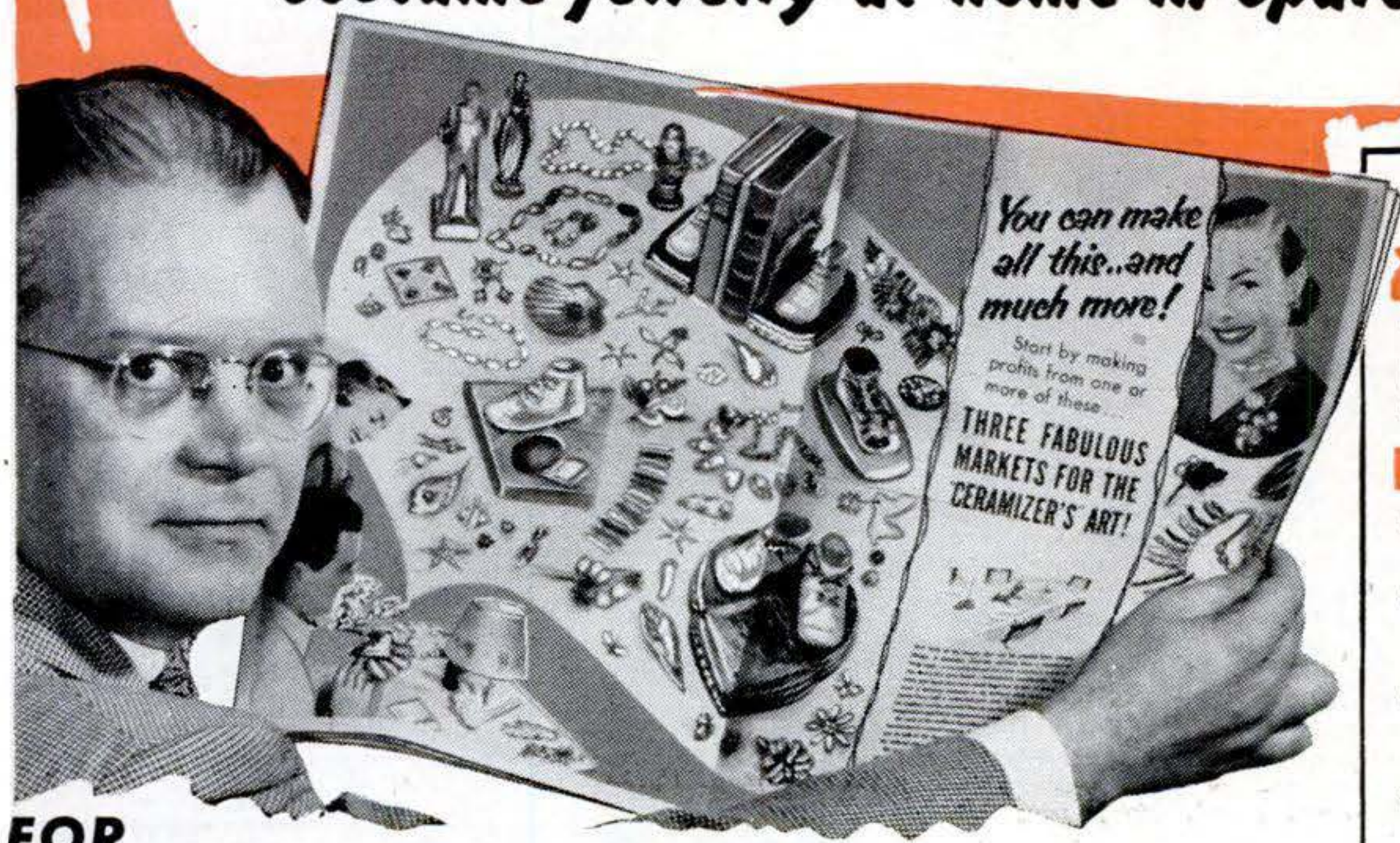
Start Your OWN ELECTRICAL APPLIANCE REPAIR BUSINESS

Repair electrical appliances of friends and neighbors. Service electrical equipment in factories, stores, etc. Work full or part time! New Shop Method home-training system. Rush name today for **FREE BOOK** and special form for getting Electronic Kit, Valuable Heating Element Kits, Advisory Service and Illustrated Instructions on new easy-payment plan. Pay later from **EARNINGS WHILE LEARNING.** Rush name today.

CHRISTY TRADES SCHOOL
4432 N. Kedzie Dept. D-801 Chicago 25

Copyrighted material

"Let me show you how to make all these beautiful objects of art, giftwares, and costume jewelry at home in spare time"



FOR

PLEASURE or PROFIT!

Make as much as $5.00 for One Hour's Work

Yes, I will send this to you free. It tells all about one of the most astonishing discoveries of recent years. Shows how 56c worth of material can be turned into a $5.00 profit. Shows how to make "something from nothing." A handful of twigs is transformed into a gorgeous coral-like necklace—a stunning dresser box is made from a penny's worth of rice and a few navy beans — a metal-like lapel pin from a live leaf. You need no knowledge of design—no artistic training. The countless forms of nature provide your designs. The simple art of "Ceramizing" can be learned in a few minutes' reading by even a child. It's an activity in which the entire family can take part. It's a fascinating hobby that makes friends marvel at your artistic ability—yet it's so profitable that it can be turned into a big money business, operated from your home. Many men find in Ceramizing the opportunity to establish a spare time home business without sacrificing job or paycheck—and gain confidence for the future in knowing that at any time they can expand into full time work—taking profits from three different branches of the business. Women, too, find in Ceramizing a satisfying expression of their creative gifts—both as a hobby and as a means of making extra money. One of the big advantages is that no expensive equipment, machines, or tools are required. And I show you how and where to go to get the few materials necessary at low cost.

FREE!

This beautiful eight page book in full color shows you

HOW TO..

- Learn all the secrets of Ceramizing.
- Turn twigs, leaves, flowers, into gorgeous costume jewelry.
- Transform inexpensive articles into valuable objects of art.
- Get the thrill of artistic creation without learning to draw or design.
- Start a spare time hobby that can bring extra money every week.
- Establish a home business that can be expended into full time operation any time money is needed.

FREE!

JUST SEND NAME

NO CHARGE Now or at any other time JUST MAIL COUPON

You can even preserve and beautify baby shoes to look like silver, gold, bronze, or glistening kiln fired china by this amazing process. They bring profits of $10.00 for every dollar of material cost.

NO SALESMAN WILL CALL—ALL MAILED FREE!

Send your name to me today. A penny postcard will do, or mail the coupon. I will send you a beautiful eight page book filled with pictures in natural colors showing scores of the things you can make and explain the entire process and the steps necessary to get started. No salesman will call to bother you—and the information is all free and postage prepaid. Whether you want to start now or at some future time—get the information at once. You'll be glad you wrote. Address me,

R. E. BRANDELL, WARNER ELECTRIC CO. 1512 Jarvis Ave., Dept. 210 Chicago 26, Illinois

Raymond E. Brandell, Warner Electric Co.
1512 Jarvis Ave., Dept. 210, Chicago 26, Ill.

Dear Mr. Brandell: With the understanding that there is no charge, no obligation, and that no salesman will call, you may mail postpaid a copy of your big eight page book in full color showing scores of pictures of things I can make, either as a hobby or as a spare time money making home business.

Name.....

Address.....

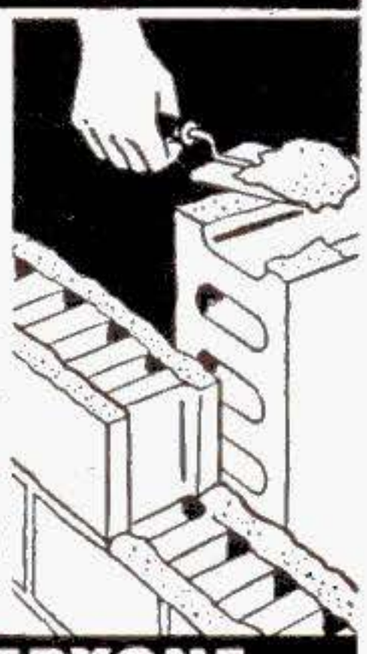
City.....State.....

Copyrighted material

HOME OWNERS! BEGINNER! TRADE EXPERT!

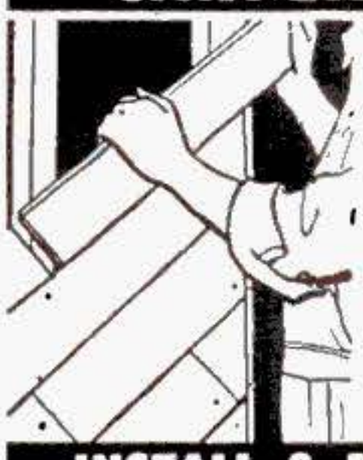
LEARN and SAVE, REPAIR or BUILD with these practical books.

CONCRETE BLOCK BUILDING



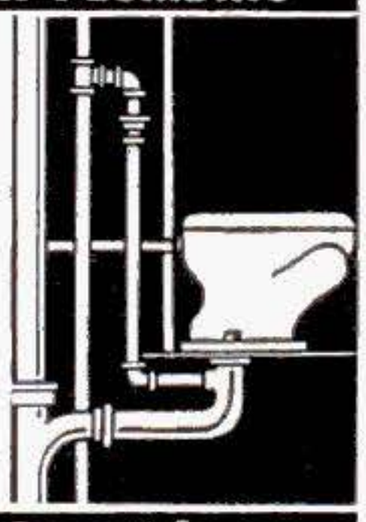
Concrete Block Construction for Home and Farm by Dalzell & Townsend. No need for any previous building experience to build that garage, summer home or milk house with concrete blocks. This practical guide shows every step from how-to-plan to how-to-build with one of the most plentiful and economical building materials known to man. Over a hundred pictures and cutaway diagrams show exactly what to do and what not to do. Tells how to place corner block, how to make foundations easy, how to paint for special purposes. A picture story of everything in building any type of structure with concrete blocks, easily and cheaply. 216 pages. Profusely illustrated. *Use handy free trial coupon below.* $2.75

CARPENTRY FOR EVERYONE



Carpentry by Gilbert A. Townsend. A clear explanation of modern carpentry construction including framing, roof constructions, general carpentry work, exterior and interior finish of buildings, building forms and working drawings, and farm buildings. Covers everything you need to know about lumber, tools, joints and splices, floors, stairs, partitions, rafters, etc. Gives short cuts and tricks used by the master carpenter. Easy-to-understand, 504 pages, 580 illus. $2.50. *Use no-risk coupon below.*

INSTALL & REPAIR YOUR OWN PLUMBING



How to Design and Install Plumbing by A. J. Matthias, Jr. A guide that fits the needs of the beginner yet so complete that even the master plumber can pick up some new tricks of the trade. Contains hundreds of illustrations, full-size blueprints, specifications and instructive details for septic tanks, storm drainage, soil pipe, water supply, fixtures, traps, drains, pumps, etc. An outstanding feature is complete design and installation of plumbing in a modern six-room, two-bath residence. 349 illustrations, 442 pages. $3.50. *Use free-trial coupon below.*

IT'S EASY TO REMODEL!

How to Remodel a House by Dalzell and Townsend. With this practical, easy-to-understand book, crammed with clear explanations and illustrative examples, you can remodel any house and save thousands of dollars. Learn to plan the remodeling of rooms by a method that's like playing with blocks! Tells how to read architectural plans, shows structural details, covers stairs, insulation, bathrooms, kitchens, heating and air conditioning, etc. Sixteen full-size blueprints. 505 pages, 350 illustrations. $5.00. *Mail no-risk coupon below!*

MAIL THIS NO-RISK COUPON! DON'T DELAY!

American Technical Society C720
848 E. 58th Street, Chicago 37, Illinois

Please rush me the following How-to-Do-It-Books I am checking below. If I'm not convinced that these books will help me save many thousands of dollars by building and planning myself, I may return the books within 10 days and receive full and immediate refund.

- ☐ CONCRETE BLOCK CONSTRUCTION FOR HOME AND FARM $2.75
- ☐ CARPENTRY 2.50
- ☐ HOW TO DESIGN AND INSTALL PLUMBING.... 3.50
- ☐ HOW TO REMODEL A HOUSE..... 5.00

Print Name_____

Address_____

City & Zone_____ State_____

☐ I enclose _____ in full payment. Ship prepaid.

☐ Ship C.O.D. for _____ plus postage and C.O.D.

PARTS FOR MILITARY TRUCKS

At A Savings. New FREE Catalog

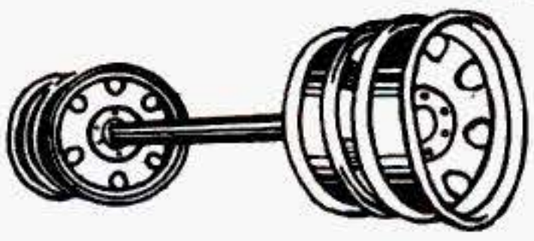
For Jeep, Dodge, Chevrolet, G.M.C., Studebaker

Brand New—Not War Surplus—Complete

JEEP TOPS and SIDE CURTAINS

Fits all Military Jeeps. Also adaptable to some Civilian Jeeps. Waterproof O.D. **$59.50**

AXLES FOR TRAILERS



(Surplus) Heavy Duty axles suitable for building of many types of trailers, farm wagons, etc. Standard width straight axle, 2 inch square and is complete with Hubs, Timken bearings, 6 Hole 750x20 or 825x20 wheels, without brakes, only..... **$69.50**

Dual Wheels . . . add $15.00 extra

Hundreds of Other Truck & Jeep Parts and Supplies

All prices quoted good 30 days FOB, Kansas City

25% deposit required on COD orders.

JEEP MOTORS **UNITED AUTO PARTS CO. INC**

1901 TROOST·GR.1800·KANSAS CITY, MO.

Learn ACCOUNTING BOOKKEEPING

This nationally renowned school has demand for graduates in good salary positions thru Nationwide recognition and placement service. Write Department PSG today for Big 32 page Success Book to be sent to you **FREE**

Hills BUSINESS UNIVERSITY AND EXTENSION SCHOOL

619 W. MAIN ST., OKLAHOMA CITY 2, OKLAHOMA

LEARN MEAT CUTTING At Home—In Spare Time

Get into the vital meat industry. Concise, practical Home Training based on 25 years proven instruction methods used at National's famous resident school. Prepares you for bigger pay as Meat Cutter, supervisor, market manager or more money in your own store. Go as rapidly as your spare time permits. Diploma. Start NOW to turn your spare hours into money. Send for FREE bulletin today. No obligation.

National School of Meat Cutting, Inc., Div. O-107, Toledo 4, Ohio

SEND FOR THIS FREE!

Make money. Know how to break and train horses. *Write today for this book FREE*, together with special offer of a course in Animal Breeding. If you are interested in Gaiting and Riding the saddle horse, check here ( ) *Do it today—now.*

BEERY SCHOOL OF HORSEMANSHIP

Dept. 5810 Pleasant Hill, Ohio

WANT TO SAVE GAS? BE PREPARED IF RATIONING COMES

AMAZING GANE NEEDLE | TRY ONE FREE IN YOUR CAR!

1/2 MILLION NOW IN USE!

MANY GANE NEEDLE USERS REPORT UP to 25% more mileage, faster pickup, easier starting and smoother idling.

NOW TEST A GANE NEEDLE IN YOUR CAR for ten days, then compare your mileage and performance. If satisfied, send $1.50 per needle (8 cyl. cars take 2). If not satisfied, just return it—fair enough? Since authorities differ on its merits and some users report no improvement, TRY BEFORE YOU BUY! (Gane Needle replaces idling adjustment screw in carburetors—easily installed in a few minutes.)

FREE Auto Economy Manual

Tells how to save gas, tires, brakes, etc. Also introduces many new economy products. (Sent absolutely free to all who try Gane Needles.)

WRITE TODAY. ENCLOSE NO MONEY. PAY POSTMAN NOTHING.

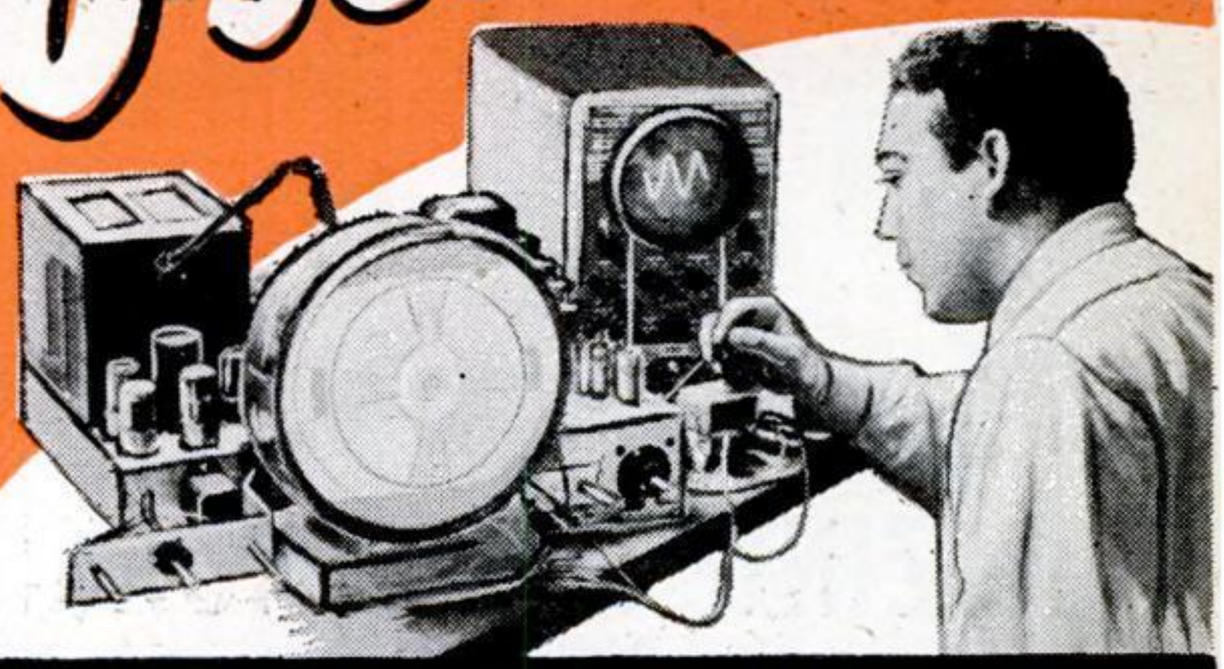
Just send us your name, address, and make and year of car.

NATIONAL AUTOMOTIVE RETAIL CORP., Dept. H-10

350 W. Washington Blvd. Venice, California

NOW you can learn TV-RADIO servicing at Home

in your spare time!



BIG DEMAND FOR TRAINED MEN!

Famous CRESCENT SCHOOL of Radio & Television now offers a *complete* HOME STUDY COURSE for those unable to attend classes! CRESCENT SCHOOL's experience of millions of training hours assures you of the finest training available. New simplified lessons and illustrations — *no previous training needed!*

Get into this high-paying field with a future! Many students start to earn extra cash while learning. Complete the course as quickly as you can learn. Certificate awarded upon completion of course. CRESCENT SCHOOL's free placement service is available to you!

INCREASED EARNINGS

INTERESTING WORK

AN UNLIMITED FUTURE

PAY AS LITTLE AS $5 MONTHLY

Total cost for complete course as little as $100

Crescent School — one of the largest of its kind! Multi-million-dollar plant in its own 6-story building.

FREE!

Send TODAY for FREE sample lesson & complete details about the Crescent School HOME STUDY COURSE!

SEND COUPON TODAY!

CRESCENT SCHOOL Dept. A-10
500 Pacific St., B'klyn 17, N. Y.

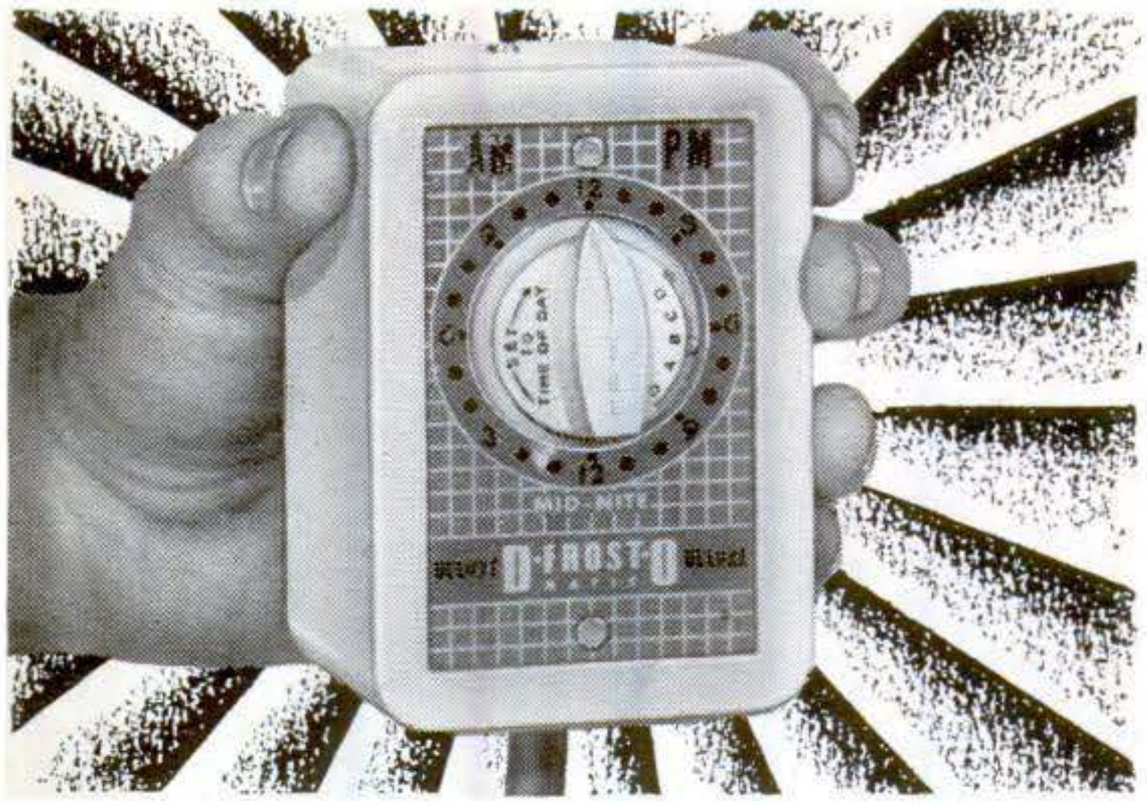
Sirs: Rush free sample lesson & complete details about your HOME STUDY COURSE . . . at no obligation to me.

NAME .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

Copyrighted material

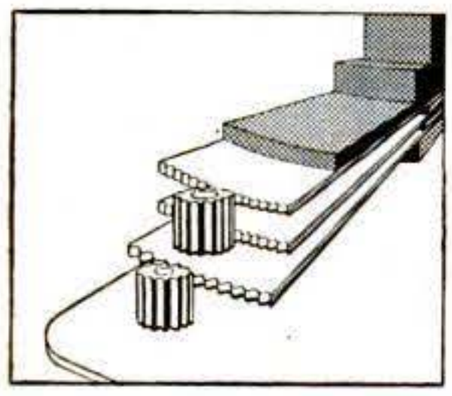


AMAZING INVENTION EXCITES MILLIONS

OWNERS of electric refrigerators are excited about an amazing invention that automatically defrosts these "ice boxes" every night, without mess, work, or attention. The tremendous demand for this Patented invention, the D-Frost-O-Matic, is creating big-money-making opportunities for men and women. They use a FREE TRIAL plan that assures sales in three out of five homes.

They earn up to $210.00 a week just spending a few hours a day plugging in units on a Free Trial basis.

FIRST VERNIER GEAR USED IN A TIME CONTROL



Never before has a Vernier gear been used in an automatic control of this type. The unit is greatly simplified, and gives trouble-free service for years. Designed by Karl Brocken, member of the Society of Industrial Designers.

Independent Laboratory Test Makes Selling Easy . . .

Tests by the famous U. S. Testing Company, Inc.* proved the D-Frost-O-Matic saves 20% of electricity, saves excess wear on refrigerators, and keeps food fresh and appetizing for longer. The Free Trial plan is making up to $21.00 an evening for men and women who sell in spare time, with far larger sums for full time.

If you would like to earn a great deal of money mail the coupon below right now, for the D-Frost-O-Matic FREE TRIAL plan.

SEND COUPON NOW!

Mr. Sidney Lewis
D-FROST-O-MATIC CORP.
6 N. Michigan Ave., Dept. PS-10, Chicago 2, Ill.

Please RUSH your GUARANTEED PROFIT and FREE TRIAL plans, with the U. S. Testing Company's report on the new Patented D-Frost-O-Matic.

Name . . . . . .

Address . . . . . .

Town . . . . . **State** . . . . . .

**Test No. E-2059*

No Experience Needed To

PRINT YOUR OWN POST CARDS

The GEM STENCIL DUPLICATOR saves money . . . gets results quickly! Hundreds of uses for every type of business and organization. We ship the GEM complete with all supplies, Guide Board for accurate printing and 60-page Book of Ideas at the special low price of only **$8.50** (a $15 value).

FREE TRIAL OFFER *Our 21st Year*

Use the GEM **FREE** at our expense! SEND NO MONEY. Write and complete GEM outfit will be sent you postpaid. After ten days, send us only **$8.50** or return the GEM. You must be satisfied!

BOND EQUIPMENT CO. **Dept. 49**
6633 Enright • St. Louis 5, Mo.

RADIO ENGINEERING

Television, FM, Broadcasting, Servicing, Electronics, Aviation, Marine & Police Radio taught thoroughly. 72 weeks' Engineering course equivalent to 3 years' college radio work. Approved Veteran Training. Catalog upon request.

VALPARAISO TECHNICAL INSTITUTE
Dept. 503 **Valparaiso, Ind.**

PROFITS MAKE YOUR OWN RUBBER MOLDS

WRITE TODAY FOR NEW FREE CATALOG

Learn to cast thousands of perfect figurines, plaques, book ends, ash trays, etc. Start TODAY!

NO EXPERIENCE GREAT PROFITS

Little capital needed. Full instructions. X.L. Rubber. Pints **$2.50**, Quarts **$4.00**. Special: 3 models and enough rubber for 3 molds prepaid for **$1.50**.

PLASTIC ARTS STUDIO
3403 S. MADISON ST. DEPT. 3, MUNCIE, INDIANA

PHOTOGRAPHY

EARN BIG MONEY! PERSONAL ATTENDANCE TRAINING in News - Magazine - Fashion - Portrait - Advertising - Natural Color Photography. Splendid equipment, glamorous models. Or — our COMPLETE HOME STUDY COURSE provides you with a spare time short-cut to success.

Our 42nd year. Write immediately for BIG FREE BOOK!

NEW YORK INSTITUTE OF PHOTOGRAPHY
Dept. 5, 10 West 33 St., New York 1, N. Y.

How to Always Have HOT WATER

Make Your Own Automatic Electric Water Heater now for only $19.95

Install in 5 min. No disturbing or draining of tank or pipes

Why suffer without hot water? Enjoy lots of it to wash, bathe, shave. Heater keeps water HOT in your present tank. Turns ON when needed—shuts OFF when water is heated. No flue, dirt, fire!

Ideal for 30-gal. tanks. Heater screws into any size boiler tap as shown. Plugs into outlet . . . 1320 w. 110 v. AC. (also 2000 w. 220 v. model for BX cable $19.95) . . . works automatically thereafter. Temperature adjustable between 120 to 180 degrees. Replaces coal, oil, gas in home, store, summer cottage, green house, farm, barn, stock tank, poultry scalder, factory. Uses only ¼ to ½c electricity per gallon hot water. Why burn expensive main furnace unit for hot water? Send check or M.O. NOW: save postage charges. ORDER NOW . . . TODAY.

ONE YEAR GUARANTEE
U. L. Approved Heater

Money back in 10 days if not delighted.

COLLOID EQUIPMENT CO., INC. **Dept. PS10, 50 Church Street, New York 7, N. Y.**

Copyrighted material

LOOK TO LIONEL TRAINS FOR THE REAL THING

Advanced engineering . . . exclusive features . . . most realistic design and performance in 50 years of Model railroading.

Compare looks and performance. Only Lionel gives you true railroad perfection.

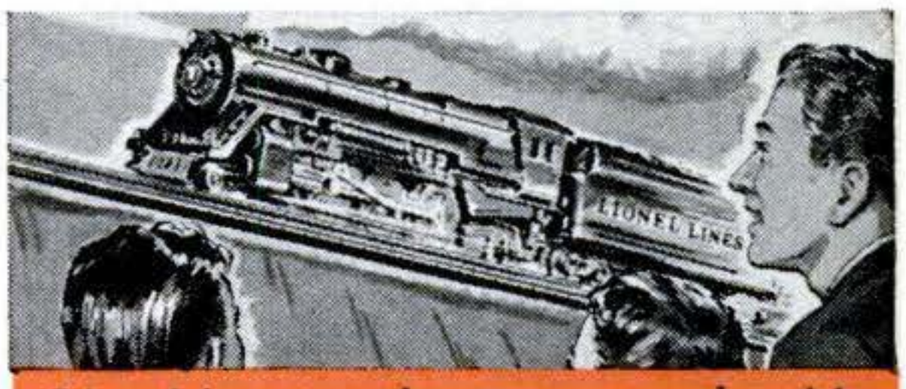
More than fifty years of engineering are behind these great LIONEL TRAINS . . . pioneering . . . inventing sensational new features. Lionel was first with trains that puff real smoke . . . whistle by remote control. Lionel stepped even farther ahead with the only real R.R. remote-control knuckle couplers, and exclusive Magne-Traction*. You get the World's Finest when you get LIONEL trains. Free catalogue at your dealer's . . . or send coupon for special offer.

*available in all "0" gauge sets and in most "027" sets

FUN for ALL

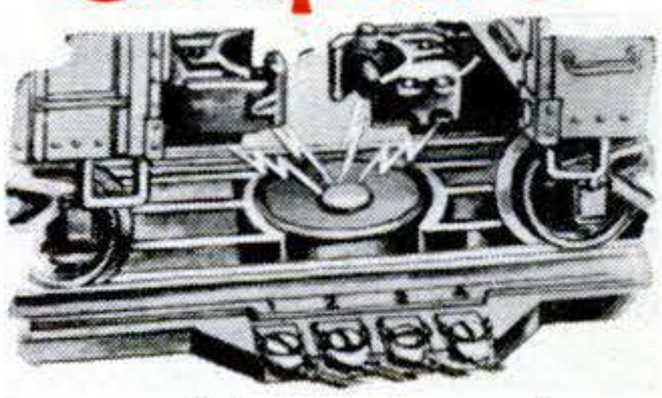
MAGNE-TRACTION

Lionel locos with Magne-Traction climb grades where others can't even start. Add mountains and curves to layouts never before possible. This Lionel development increases train speed, pull, climb, and control. A permanent Magnetic grip through truck and wheels does it. A Lionel exclusive.



Lionel loco speeds up steep grade with magnetic track-holding power more efficient than deadweight.

Real R.R. Knuckle Type Couplers

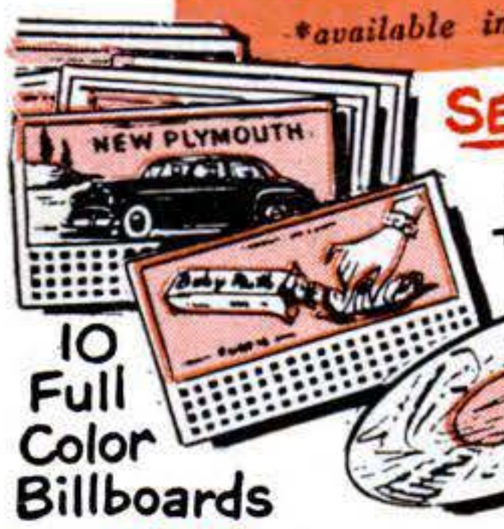


Remote control button uncouples cars instantly. Cars couple automatically when brought together. Only Lionel has this remote control, electro-magnetic coupler. It's designed after A.R.A. Knuckle Couplers that are standard on American railroads.

Smoke
Clean, white smoke puffs with action of drivers.

Whistles
Two-toned built into tender — real R.R. pitch — remote-control operation.

Die Cast Trucks Solid Steel Wheels



10 Full Color Billboards

SEE all the LIONEL TRAINS and accessories in the new catalog

Hear...Bells...Horns whistles on this Rail-Road sound effect record

ALL FOR ONLY 25¢

Special Coupon Offer

LIONEL TRAINS, P. O. Box 362,
Madison Square Station, New York, N. Y.

Please send me special Lionel Train catalog offer, postage prepaid. I enclose 25¢ to cover postage and packing.

1. The new 36-page full-color Lionel catalog.
2. The new 5½" double-faced record* of whistles, bells, railroad sound effects and Diesel horns.
3. 10 full-color miniature billboards.

Name_____

Address_____

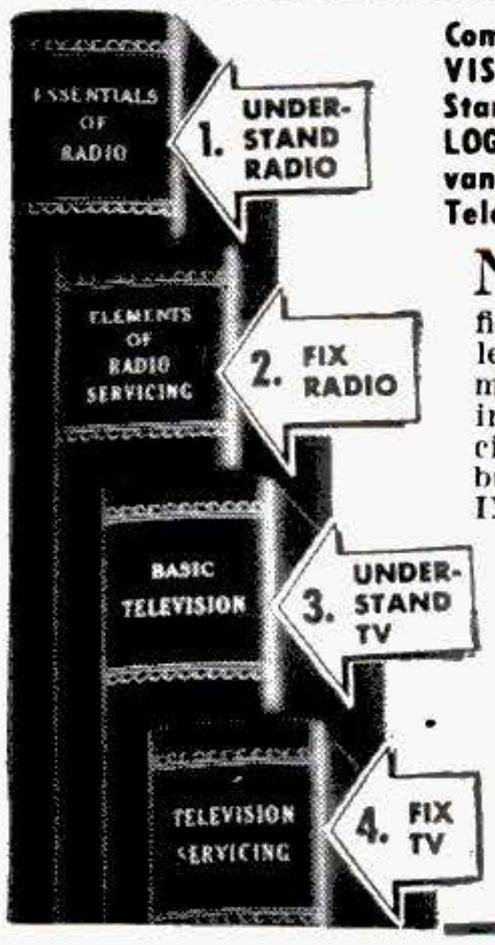
City_____ State_____

*Plays on all 78 RPM phonographs except some spindle or automatic changers.

Copyrighted material

NOW! Write Your Own Ticket In This ESSENTIAL Industry!

4 Easy Steps to Big Money in Television-Radio



Complete Self-Training Course In TELEVISION and RADIO Prepared by Experts—Starts From Scratch, Takes You BY SIMPLE LOGICAL STEPS From Basic Theory to Advanced Problems of Repair, Installation, Televising, Color TV, etc.

NOW you can do ANY TV-Radio installation, service, or repair job; operate field-testing equipment; understand problems of TV broadcasting, FM-AM transmission, etc. Step into a good paying job in the booming electronic field. Get a specialist's rating—or start your own service business. Train yourself AT HOME . . . IN YOUR SPARE TIME . . . with the McGraw-Hill Basic Course in TV and Radio.

2296 Pages—1611 Illustrations

Complete 4-volume course, by outstanding radio and TV instructors. Every detail clearly explained. Over TWO THOUSAND PAGES of step-by-step instruction. Over SIXTEEN HUNDRED "how-to-do-it" illustrations, cross-section diagrams, etc. "Trouble-shooting" charts show how to diagnose any radio or TV breakdown, how to repair it expertly.

Pays for itself many times over. Can qualify a beginner for FCC's 1st-Class License test; shows experienced technician new tricks.

SEND NO MONEY

Over 8 million TV sets . . . 60 million radios in use. Shortage of skilled workers is critical. Men who know electronics can write their own ticket in Government OR private enterprise! They are ESSENTIAL! Course can put you in line for success in America's fastest growing industry!

Mail coupon to examine complete four-volume course FREE for 10 days. No obligation. Or examine individual books FREE for 10 days by checking proper boxes in coupon. Mail coupon at once!

PARTIAL CONTENTS

ESSENTIALS OF RADIO, 800 pages, 433 illus. Circuit Analysis • Vacuum Tubes • Circuits • Amplifier • Tube Oscillator • Power Supply, etc.

ELEMENTS OF RADIO SERVICING, 475 pages, 375 illus. Speakers • Antennas • Auto Radios, etc.

BASIC TV, 592 pages, 415 illus. Synchronizing • Video Signal • Brightness Control • FM Alignment • Picture Tubes, etc.

TV SERVICING, 429 pages, 388 illus. Antennas • Localizing Reception Troubles • Interference Remedies . . . **AND MUCH MORE!**

FREE 10-DAY TRIAL COUPON

McGRAW-HILL BOOK CO., Inc., Dept. PS-10-51
327 West 41st St., New York 18, N. Y.

Please send me for 10 days' FREE EXAMINATION **McGraw-Hill's Basic Elements of Radio & TV . . .** including **Essentials of Radio Elements of Radio Servicing, Basic Television, Television Servicing** (Total retail price of the four books is $23.75—Special Course Price: Only $19.95 in easy installments). If not satisfied with course, I will return the four course books; pay nothing. Otherwise, I will send you only $1.95 plus postage **then;** and the balance in 6 monthly installments of only $3.00 each.

If you wish to examine any of these books individually, check below the ones you wish us to send you for 10 Days' FREE EXAMINATION:

- ☐ **Essentials of Radio, $6.50**
- ☐ **Elements of Radio Servicing, $4.75**
- ☐ **Basic Television, $6.50**
- ☐ **Television Servicing, $6.00**

For whichever of these books I decide to keep, I will send you $2.00, plus postage, at the end of 10 days; balance in easy monthly installments.

Name.....

Address.....

PS-10-51

City.....State.....

Company.....Position.....

☐ **WE'LL PAY POSTAGE** if you enclose first payment of $1.95 when ordering the course, or the full price of book when ordering individual books (see prices above). Same 10-Day Return Privilege for full refund.

MONTH AFTER MONTH, YEAR AFTER YEAR, YOU SEE OUR AD. REMEMBER IT'S DANGEROUS to pay less if you want the finest nonskid USED tires.

GOODYEAR Firestone

GOODRICH, UNITED STATES, GENERAL, & OTHERS, NOT RECAPS

Our policy is to select your tires so carefully, as if our very future depended on the service given by that particular tire.

FREE TUBE WITH "ALL" BLATT'S GOOD GRADE TIRES

GOOD GRADE, 16 MONTHS GOLDEN RULE GUARANTEE BOND.

600-16	$4.14	700-15	$4.54	650-20	$7.94	32x6(8)	$ 8.64
650-16	5.42	670-15	4.74	700-20	8.54	32x6(10)	9.94
700-16	5.04	710-15	4.94	750-20	8.64	900-20	13.94
650-15	4.44	550-17	4.64	825-20	15.92	1000-20	13.94

FINEST GRADE, 26 MONTHS GOLDEN RULE GUARANTEE BOND THIS GRADE MADE THE BLATT NAME "WORLD FAMOUS."

450-20	$6.00	450-21	$6.00	700-15(6)	$10	750 16(8)	$15
600-16	5.49	650-15	5.95	600-20	$9.94	900-20	$18.54
650-16	6.42	670-15	6.24	650-20	9.94	1000-20	18.54
700-16	5.94	700-15	6.54	700-20	11.94	1100-20	18.54
750-16	7.94	710-15	6.34	32x6(8)	10.54	1000-22	17.54
550-17	5.94	760-15	6.54	32x6(10)	13.92	1100-22	18.54
525-18	5.54	820-15	7.04	750-20	12.54	1200-22	22.54
650-19	9.00	475-19	5.94	825-20	22.84	1100-24	21.54

900-16		600-16		Military	750-20	
Reg.	$10.94	Reg.	$6.75	Reg. 16 mos.	Reg.	$10.44
Super	19.94	Super	9.75	Super 30 mos.	Super	18.64

BLATT BLATT BLDG., GIRARD & LANCASTER AVES., DEPT. P.S., PHILADELPHIA 31, PA.

Send check or money order and this ad for rush shipment. We won't ship a tire we wouldn't use. The name to trust in rubber.

PRICES SUBJECT TO CHANGE

Shipments RUSHED Down South, Up North and Far West

DON'T FIGHT YOUR FUTURE

TAKE HIGH SCHOOL AT HOME

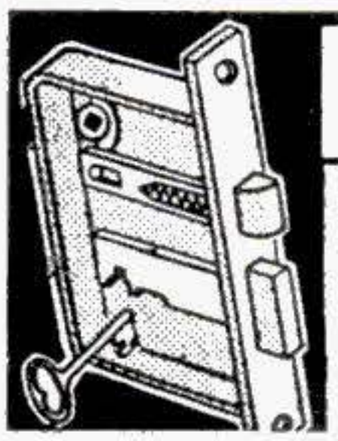
Take life easier—make business and social success *more certain*—as a high school graduate! Earn your diploma *at home in spare time*—in 18 to 24 months. C.T.I. *Guided Study* equals resident work. *Books supplied.* Credit for school elsewhere. College prep. Terms. *Write for details!*

COMMERCIAL TRADES INSTITUTE
1400 Greenleaf Ave. Dept. H1-10 Chicago 26, Ill.

New Way to Improve YOUR ENGLISH

A command of effective English gives you added advantages and better opportunities. Poor English handicaps you more than you will ever realize. You can improve your English through Sherwin Cody's 100% self-correcting invention.

If you are ever embarrassed by mistakes in grammar, spelling, punctuation, or pronunciation, this new free book "How You Can Master Good English in 15 Minutes a Day" will prove a revelation to you. Send for it **now.** It is free. No obligation. No agent will call. Address **SHERWIN CODY COURSE IN ENGLISH, 1810 B & O Building, Rochester 14, N. Y.**



FIX LOCKS

Learn Locksmithing and Keymaking from Experts in Your Spare Time at Home!

Locksmiths in big demand! No layoffs, no slow seasons! Age or physical handicap no disadvantage. Year-round, steady income in this permanent, respected field. Full or part time. Practical, illustrated lessons show you how to make money even while learning! All materials and special tools supplied. Send for FREE BOOKLET.

LOCKSMITHING INSTITUTE, Dept. PS-22
15 Park Ave. Rutherford, N. J.

MODEL BUILDERS!

NEW 1951 CATALOG

MODEL AIRPLANE ENGINES • GLOW PLUGS • MARINE ENGINES • FUELS MODEL RACERS • ACCESSORIES

CUT OUT AND MAIL TODAY

OHLSSON & RICE, INC.
3340 Emery St.,
Los Angeles 23, California

Please RUSH_____copies of the NEW 1951 O&R Catalog at 15c each for which I am enclosing_____in stamps or coins to cover handling and mailing.

Name_____

Address_____

City_____Zone_____State_____

BEFORE YOUR ENGINE GETS BALKY...

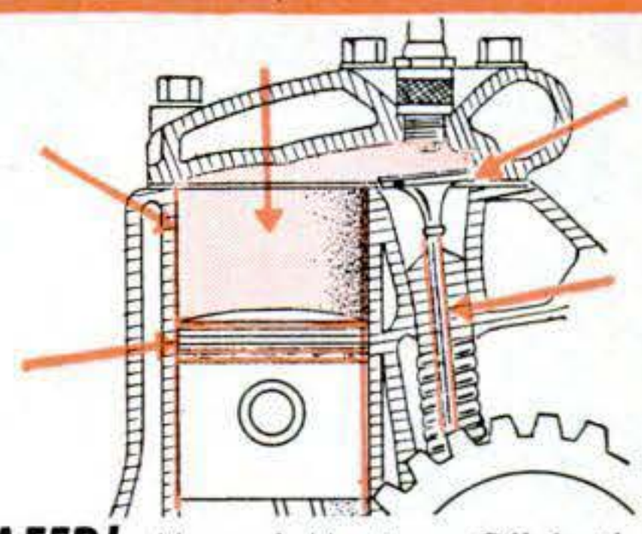
MAKE THIS ROAD TEST

with

MARVEL *mystery oil*

Next time you change oil, add a quart of Marvel ... you'll marvel at the difference it makes

- Prevents hydraulic valve troubles
- Prevents internal motor rust
- Prevents carbon formation
- Provides ring seal
- Frees sticky valves



SAFER! Marvel Mystery Oil is the result of more than 30 years of lubrication research and improvement — specially developed for today's high-compression engines. Unlike many other oil additives, it contains no harmful acids or graphites — instead, it protects and adds to the life of your motor!

SMOOTHER! Marvel goes to work where regular oils stop. It combats top-cylinder dry-firing . . . reduces wear . . . keeps your engine free of gum, sludge and varnish. That means a dream of a ride, even under the most extreme conditions of pressure and heat.

SEE YOUR REGULAR GAS STATION OR DEALER .....write us for FREE information and the name of your nearest supplier.

BE ENGINE WISE... MARVELIZE NOW!

Use Marvel Mystery Oil in the crankcase, gas tank or any top-cylinder oiler.

EMEROL MANUFACTURING CO., INC.

Dept. 110 • 242 West 69th Street, New York 23, N. Y.

Copyrighted material

GET THE WORLD'S LEADING

RADIO & TV CATALOG

★

FREE

★

1952

212-Page Edition

★

ALLIED'S

BIG COMPLETE BUYING GUIDE

Save on Everything in Radio and TV

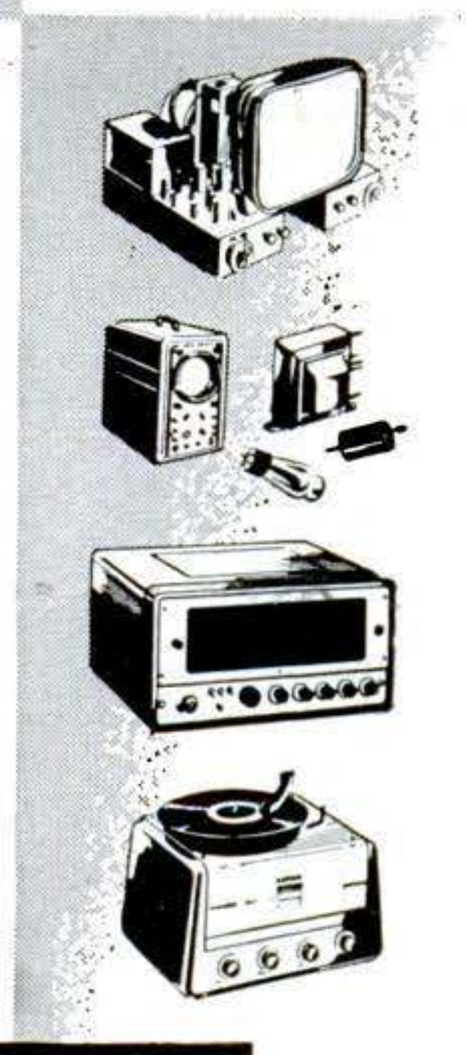
NEW

UP-TO-DATE

SEND FOR IT NOW

Everything for Experimenters, Builders, Amateurs, Servicemen, Engineers and Soundmen

Send for ALLIED's 212-page 1952 Catalog, the value-packed guide to *everything* in Radio and Television! Latest home radios, TV equipment, Amateur supplies, P.A. Systems, Hi-Fidelity Sound, recorders, test instruments, builders' kits—plus the world's largest stocks of electronic parts, tubes, tools, books and diagrams. Get more for your money—send today for your FREE 1952 ALLIED Catalog!



Get Radio's Leading Buying Guide Today

FREE!

ALLIED RADIO

ALLIED RADIO CORP., Dept. 7-KK-1
833 W. Jackson Blvd., Chicago 7, Ill.

☐ Rush FREE 1952 ALLIED 212-Page Catalog.

*Name*_____

*Address*_____

*City*_____ *Zone*_____ *State*_____

MEN! send for this MONEY-MAKING OUTFIT FREE!

MAKE UP TO $15.00 IN A DAY

Do you want to make more money in full or spare time . . . as much as $15.00 in a day? Then write for this BIG OUTFIT, sent you FREE, containing more than 150 fine quality fabrics, sensational values in made-to-measure suits and overcoats. Take orders from friends, neighbors, fellow-workers. No experience needed. You'll say it's the greatest way to make money you ever saw.

SAMPLE SUITS TO WEAR

Pay No Money! Send No Money!

Our plan makes it easy for you to get your own personal suits and overcoats without paying 1c, in addition to your big cash earnings. This offer is limited. Rush your name and address for big FREE OUTFIT—today!

J. C. FIELD & SON, Dept. Y-1720
Harrison & Throop Streets, Chicago 7, Illinois

Learn CARPENTRY BRICK LAYING

Get into the billion dollar building trades. Learn now while opportunities are greatest. Train in our completely equipped shops under expert instructors. Enroll now. Limited Classes. Resident and Home Study. Write for FREE catalog.

MIDWEST SCHOOL OF BUILDING TRADES, Dept. PS-10
411 N. Center St. Bloomington, Ill.

EASY TO LEARN CODE

Learn or increase speed with an Instructograph—the Radio-Telegraph Code Teacher that takes the place of an operator-instructor and enables anyone to master code without further assistance. Available tapes from beginners alphabet to typical messages on all subjects. Speed range 5 to 40 WPM. Always ready—no QRM. Thousands have "acquired the code" with the Instructograph System. Write today for convenient rental and purchase plans.

INSTRUCTOGRAPH COMPANY
4701-P Sheridan Road, Chicago 40, Illinois

MAKE YOUR OWN! WITH

GRIFFIN LEATHERCRAFT KITS

Best assortment of tools, materials in U.S.A.! Send 25¢ for 116-page catalog. *(money refunded first order)*

GRIFFIN CRAFT SUPPLIES
SINCE 1924
5626-B Telegraph Ave., Oakland 9, Calif.

Tells How You Can Learn to MOUNT BIRDS!

Learn At Home

Men, Boys, Hunters, Fishermen, **mount** and **save** your lovely wild-game **trophies.** Be a **Taxidermist.** Mount **Birds, Animals, Heads, Fish, Tan** skins. **YOU** learn easily, quickly in **spare time.** Have a grand **home-museum.** The finest and the greatest **hobby known,** for sportsmen. **Fun,** real **profits.**

FREE BOOK

Yes, **FREE.** Beautiful **strange,** valuable **Book,** telling **all** about Taxidermy. Contains over **100** beautiful game-pictures. And it's yours **FREE,** if you rush your request. You can mount **all kinds** of **wild-game,** and common specimens too. We can positively **TEACH YOU.** So **GRASP** this opportunity. **RUSH** letter or postal for this amazing **FREE BOOK.** Don't delay. State your **AGE.**

N. W. SCHOOL OF TAXIDERMY, 2610 Elwood Bldg., Omaha 2, Neb.

GET THIS FREE BOOK!

Copyrighted material

Sensational New...

"BLINKER" HANDILITE

AUTOMATIC FLASHER LANTERN

CONSUMER DEMAND RUNNING WILD ON SPECTACULAR ONE SECOND DEMONSTRATION—A "GOLDMINE" FOR SALESMEN AND DISTRIBUTORS

So new only a handful of salesmen have it—yet such crazy things are happening it is unbelievable. Grahem, a spare-time salesman, ordered six. He unpacked them at work and the other employees were so thrilled by HANDILITE that all six were sold in his own office. In 10 minutes he made $14.70 and had to order 12 more. Dunlop walked into a large office building with the red flasher "on." Within a half hour, he had sold 5 to building employees before even hitting the offices. He sold twelve—all he had—within the hour! But it is no wonder people buy HANDILITE as soon as they see how it works—what it does!

Now at last roadside accidents can be averted when car owners are forced to park their cars at night for tire changes or emergency repairs. For the first time, a vivid F-L-A-S-H-I-N-G RED signal light has been incorporated in a portable, battery-powered electric lantern. The amazing one-second "Wordless Demonstration" makes sales as fast as you turn the switch. Irresistible appeal is already sweeping thousands of Salesmen and Distributors to new money-making successes.

THOUSANDS WANT IT

FORTY MILLION MOTORISTS need and want HANDILITE. TRUCK and FLEET OWNERS, VACATIONISTS, SPORTSMEN, HOMEOWNERS and FARMERS want it as perfect emergency light. A perfect warning light—also unequalled as a general purpose lantern—as boat light, for hunting, camping. A thousand uses—in garage, basement, attic—for nighttime trips to farm buildings, as tractor or farm wagon light—for summer homes and summer resorts.

LONG NEEDED INVENTION

Make no mistake. HANDILITE is no novelty invention by a hopeful unknown. It is produced by the same manufacturer whose products are already standard with the mighty railroads of the country.

Selling HANDILITE is not like selling anything you have ever sold before. Here is a dazzling, convincing new product that literally sells itself. Walk in anywhere. Flip the switch—immediately your prospect sees the vivid red signal light flash its warning—visible a mile away. A second turn—on comes the white light casting a brilliant beam for 1,000 feet, while the red light continues to blink. A third turn—and the red light goes off, leaving only the white lantern beam. A fourth turn—all lights are off. WITHOUT SAYING A WORD, YOU HAVE THE MOST COMPELLING SALES TALK you've ever given!

MAKE AMAZING EARNINGS SELLING DIRECT & TO STORES

Write at once for complete facts. Learn how you can sell direct at Big Profits—Then, after cleaning up in a territory, sell stores big quantities for resale under a proven plan that moves HANDILITE fast. The first man to *open* up is going to *clean* up. So get the facts, quick. Already territories are going fast. Write, wire, or airmail the coupon—but do it this minute. *Every* minute is precious.

HANDILITE CO. Dept. 18-S Sturgeon Bay, Wis.

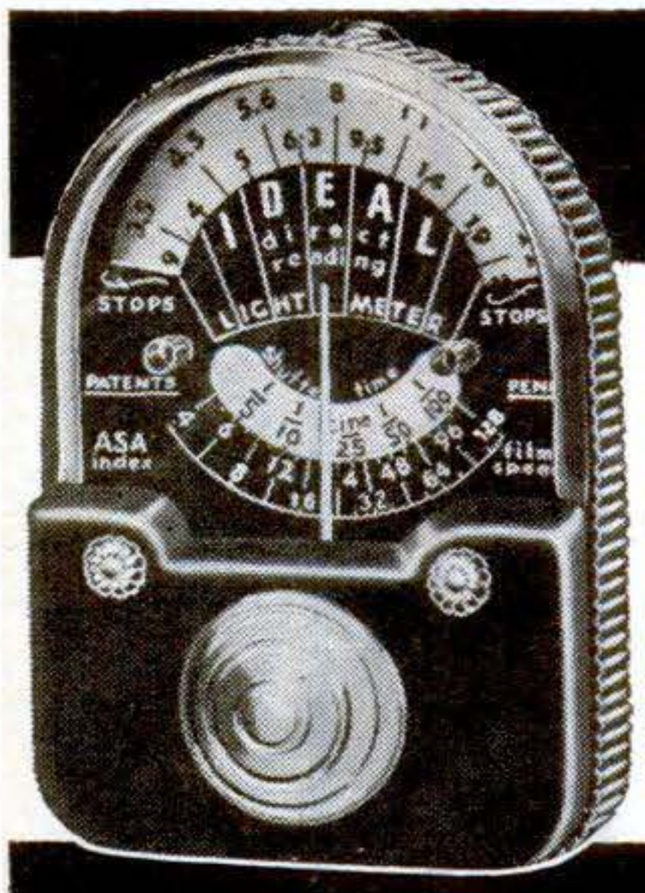
The Handilite Co., Dept. 18-S
Sturgeon Bay, Wisconsin
I want to get in on HANDILITE. Rush facts and sample offer at once.

Name.....

Address.....

City..... State.....

Copyrighted material



"IDEAL" EXPOSURE METER

Accurate photo-electric light meter, for perfectly exposed pictures. Reads directly in "f" stops,—no calculating. Simple, quick, easiest to use. For all movie and still cameras, regular or color film.

THREE YEAR GUARANTEE $9.95 incl. tax

"IDEAL" RANGEFINDER

Precision optical instrument shows exact distance for perfect focusing and clear, needle-sharp pictures. Just look through finder and turn knob until double images come together. Specify metric or feet scale.

THREE YEAR GUARANTEE $2.95 incl. tax

AT YOUR DEALER
OR SEND CHECK OR MONEY-ORDER DIRECT. WE PAY POSTAGE.

FEDERAL INSTRUMENT CORP.
DEPT. PS10 14-02 BROADWAY LONG ISLAND CITY 6, N. Y.

PLYWOOD BOAT KITS

$97.00 (Freight Included)

Build this 12-ft. sport runabout from ready-cut parts. Kits include all hardware, paint, etc., to complete the boat shown. Send for free folders of all models as low as $32.00 *freight included.*

TAFT MARINE WOODCRAFT
Dept. S, 636 39th Ave., N. E., Minneapolis 21, Minn.

MAKE EXTRA MONEY **PLASTICS** LEARN AT HOME

There are RICH OPPORTUNITIES for MEN and WOMEN with "know-how" in Plastics. Interstate's amazing new Plastics course tells and shows how to make hundreds of fast selling items out of Plastics. Gives complete training in fabrication, casting, lamination, molding, etc., in simple, easy, step-by-step language and pictures.

START A PLASTICS BUSINESS OF YOUR OWN. No other industry holds such promise for the future. You can make big money manufacturing novelties, toys, signs, etc., in your own home in spare or full time. Don't wait! Learn NOW how Interstate's Plastics Training qualifies you for success in the plastics field.

Write for FREE Information Today!

INTERSTATE TRAINING SERVICE
School of Plastics
PORTLAND 13, OREGON *(Dept. C2-K)*

UP TO 25% MORE POWER FROM YOUR CAR!

Shiny Aluminum

With an ALMQUIST **DUAL MANIFOLD**

- Faster Pickup
- Extra Power
- More Economy

DEALERS WANTED

New Hi-Power Ram design ups efficiency 25%. Perfect fuel distribution, longer wear, more hi-gear driving, more gas economy! Passenger or racing cars. Full Guarantee. For Fords & Mercurys - **$38.75.** DUAL "Y" Manifold for all cars - **$12.95.**

FREE *"Soup Up Your Car"*

Famous book shows how to double power & gas mileage. Tuning, Racing & Speed Secrets, Economy. How to Build Fast Stock Cars, Racers & Hot Rods!

☐ **Handbook FREE with our big Speed Equipment Catalog showing hundreds of items—Sent postpaid for only.....25¢**

ALMQUIST ENGINEERING & MFG.
Milford 43Z Pa. DEALERS WANTED

TRAIN in Our SHOPS - -

in AIR CONDITIONING, REFRIGERATION, ELECTRICITY, MAJOR APPLIANCES, AUTOMOTIVE MECHANICS, BODY and FENDER REBUILDING

If interested write or wire

COMMERCIAL TRADES INSTITUTE Inc. of Ala.
200 S. 20th ST. BIRMINGHAM, ALA. — 254 IVY ST. N.E. ATLANTA, GA.

VETERANS ASK ABOUT G I TRAINING

Locksmithing & Keymaking

HOME TRAINING OUTFIT INCLUDES KEY MACHINE, SUPPLIES AND TOOLS NECESSARY TO GET STARTED IN YOUR OWN BUSINESS

Excellent full or part time earning opportunities. Professional outfit includes supplies, tools, key cutting machine. Get practical training from Master Locksmiths on house locks, auto locks, padlocks, etc. Learn to cut keys by code, master locks, change combinations, quickly identify key blanks, many profitable "tricks of the trade." Booklet of Information FREE. Write today.

UNITED SUPPLY & SERVICE
3231 Washington Blv'd, Dept. PS-10 Chicago, Illinois

"ERECT-A-CLOCK"

Make your own Christmas gifts and save money! The kit, attractively boxed, contains imported Swiss movement with complete instructions for assembling all the interesting parts of this pendulum clock with pine cone weight. It's easy to put together and fun for anyone! We'll pay postage on receipt of check or money order. **$4.95**

KLEIN JEWELERS
844 So. Broadway, PS 1051, Los Angeles 14, Calif.

USEFUL · EDUCATIONAL · THRILLING

FISTULA

FREE BOOK—Explains Dangers of Associated Ailments

Piles, Fissures and Rectal Abscess are common ailments that may also be associated with neglected Fistula. Our new 164-page illustrated book sent FREE. Write today—McCleary Clinic & Hospital, 1071 Elms Blvd., Excelsior Springs, Mo.

Copyrighted material

Every One's Talking About This WONDERFUL, EASY WAY TO LEARN MUSIC!

No Matter WHO You Are, or WHERE You Live, or How LITTLE You Know About Music, You Can Soon Play Your Favorite Pieces by Note. FREE BOOK Tells All About it.

No wonder over 850,000 people have chosen this modern way to learn music! Here at last is a method by which anyone can learn to play his favorite musical instrument quickly and easily.

EVEN IF you don't know a note of music now . . .

EVEN IF there is no music teacher near your home . . .

EVEN IF you couldn't afford private lessons . . .

EVEN IF you can spare only a few minutes a day, or a few hours a week . . .

EVEN IF you are "tied down" to your job or your home . . .

EVEN IF you think "you lack musical talent" . . .

EVEN IF all these things are true of you, we guarantee to show you how to play! So **quickly** your friends will be amazed. So **pleasantly** you'll really look forward to each new lesson. So **inexpensively** you'll never miss the few cents per lesson it costs!

Secret of Rapid Progress

Instead of making you do tedious scales and tiresome exercises, the U. S. School of Music Lessons (in words and pictures) enable you to **learn by playing real pieces**—right from the start! As a result, your progress is amazingly rapid. Almost before you realize it, you find yourself playing all your favorite pieces **by note.**

Why not let this famous home study method bring the many pleasures of music into YOUR life? New friends. Extra money from playing or teaching. Greater **listening** pleasure. Possibly a brilliant career. Best of all, the deep **personal** satisfaction of being able to make your own music — provide your own entertainment.

SEND FOR FREE BOOK
and Free Instruction-Sample

Let us PROVE that what we say is true. See for yourself why our School has been so successful for 53 years. Mail the coupon below and we'll gladly send you our valuable 36-page FREE BOOK — and also a Free Instruction-Sample you can try out right at home. No obligation; no salesman will call on you. **U. S. School of Music, Studio A1510, Port Washington, N. Y.** (Special Reduced Prices on instruments to our customers.)

THOUSANDS NOW PLAY WHO NEVER THOUGHT THEY COULD

Now Plays For Dances

"I DIDN'T KNOW ONE NOTE! Three months later I started to play for dances. I have been invited to many parties and made people very happy with my music."—**Miss Rosie Montemurro, Vancouver, B. C., Canada.**

Amazes Her Friends

"I bet some friends that I could learn piano quickly. They didn't believe me—because I am slow learning. Imagine their surprise when I played for them. One said, "Why, it sounds like you've been playing for years'!"—**Louise Gomez, Oakland, Cal.**

"Easy As Falling Off Log"

"It's easy as falling off a log. I have always wanted to play and now a life-long dream is being fulfilled."—**Mrs. Phyllis B. Jones, Blanding, Utah.**

Learns Faster

"I have no special talent—but thanks to your method, I play my guitar (according to impartial people) better than many students who have taken lessons from teachers for longer periods."—**Myrella-Muquette Saint-Andre, Montreal, P.Q., Canada.**

Now Famous Band Leader

"I got my start in music with a U. S. School Course. How easy it is to learn to read notes and play an instrument this 'teach yourself' way! I've enrolled my two daughters."—**Lawrence Welk, famous orchestra leader.**

U. S. School of Music,
Studio A1510, Port Washington, N.Y.

I am interested in learning to play, particularly the instrument checked here. Please send me your free illustrated booklet, **"How to Learn Music at Home"**—also the free Instruction-Sample of your simplified words-and-pictures teaching method. NO SALESMAN IS TO CALL UPON ME.

(Mr.)
(Mrs.) _____
(Miss) (Please Print Carefully)

Address _____

City _____ State _____
(Zone Number, If Any)

NOTE: If you are under 18 years of age parent must sign coupon.

- ☐ Piano
- ☐ Guitar
- ☐ Hawaiian Guitar
- ☐ Violin
- ☐ Piano Accordion
- ☐ Saxophone
- ☐ Clarinet
- ☐ Trumpet, Cornet
- ☐ Pipe, Hammond, Reed Organ
- ☐ Tenor Banjo
- ☐ Ukulele
- ☐ Trombone
- ☐ Flute, Piccolo
- ☐ Modern Elementary Harmony
- ☐ Mandolin
- ☐ Practical Finger Control

Do you have the instrument? _____

Copyrighted material

EARN MORE IN DRAFTING

MORE OPPORTUNITIES *for* EMPLOYMENT and PROMOTION

"Here I am at work making good money as a draftsman. I'm glad I sent the coupon to Chicago Tech for that Free Trial Lesson and found out how easy it is to learn Drafting in spare time at home. Today I feel secure in my job because the draftsman's work comes first on any new project. And, in addition, draftsmen can't be replaced with machines. What's more, I feel I'm slated for promotion and more pay, because I see so many draftsmen advancing to high-pay jobs."

LEARN IN SPARE TIME—AT HOME!

(or at the College in Chicago)

A few hours of pleasant home study every week—that's all. No interference with your present job. All the tools you need; drawing outfit included. With Chicago Tech's help, you train yourself step by step. This tested method—developed over 47 years of C.T.C. progress—prepares men quickly for good positions in industry.

FREE INFORMATION — SEND COUPON

To prove to you how easy it is to learn Drafting at home by the Chicago Tech method, we will send you this FREE TRIAL LESSON. No charge for this lesson, now or later. Fill out and mail coupon, or send post card today.

CHICAGO TECHNICAL COLLEGE

N-228 Tech Bldg., 2000 So. Michigan Ave., Chicago 16, Illinois

Mail me FREE Lesson with information about big opportunities in DRAFTING.

Name.....Age....

Address.....

City.....Zone...State.....

GET 150 MILES PER GALLON

ENGINEERS HAVE PROVEN THIS POSSIBLE WITH MODERN CARS!

The Electronic Spark Intensifier is only one of many ways you can gain "peak" performance. The manufacturer guarantees the following results or it costs you nothing!

✓ **More Power** ✓ **Better Mil.age**
✓ **More Speed** ✓ **Quicker Starting**

Easily installed in the center hole of the distributor cap of all cars, trucks and tractors, the intensifier boosts the high voltage passing through the distributor . . . giving a "hotter spark." This permits a wider spark gap which reduces misfiring and consequent ring and cylinder wear. FREE TRIAL, send $2.00 cash, check or money order . . . if not fully satisfied, return for full refund.

ELECTRONIC DEVELOPMENT CO.
Dept. PS-10, Box 17716 **Los Angeles 34, Calif.**

KNIT BEAUTIFUL GARMENTS

IMMEDIATELY—
With the New Portable
KNITTING MACHINE!

No Experience Needed!
- **Actually Knits Scarfs, Berets, Mittens and Afghans!**
- **You'll Learn a Satisfying New Hobby!**

Everyone knits beautiful scarfs, berets, mittens and afghans in no time at all with amazing KNITMASTER! **NOTHING COMPLICATED TO LEARN OR DO!** Just criss-cross yarn on unbreakable Pin Bar—and KNITMASTER does the rest! Your open door to hours of fun and creative relaxation! *COMPLETE with Illustrated Instructions, Yarn and Accessories!*

Send check, m.o. We pay postage. C.O.D. plus postage. 10 DAY MONEY BACK GUARANTEE IF NOT DELIGHTED! **$3.95** Complete

AINSLIE KNITTING MACHINE Co., Inc.
738 Grand Street, Dept. S, Brooklyn, N. Y.

HYPNOTIZE

Yes. Anyone. Mystify Friends. Authentic fascinating hypnotic feminine photos show you precise spellbinding methods. Instructions reveal how easily speed hypnotism is accomplished. Become an expert hypnotist. Entertain. Self-hypnosis fully explained. Amazing results. *Learn about intriguing newly developed method of mental therapy, mind-power & training while you sleep.* Free catalog of new hypnotism books sent on request.

Send for the exciting illustrated book "HYPNOTISM REVEALED" ➟ **$1**
12" Phonograph Record Inducing Group-Hypnotism & Self-Hypnosis ➟ **$5**

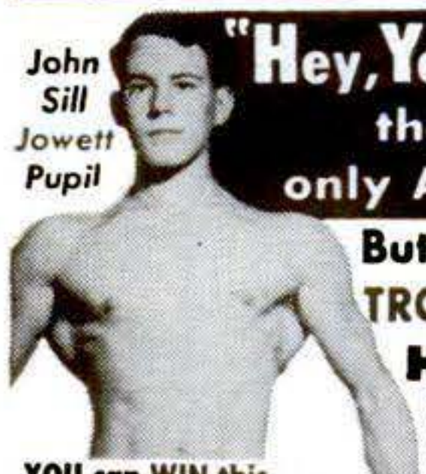
MELVIN POWERS, Master Hypnotist, 1324 Wilshire, Dept. 82 Hollywood 17, Calif.

GOLD - SILVER - COINS

Easily located with new Lightweight M-Scope Detector. Superior performance, lowest price, monthly payment plan.

FREE LITERATURE

FISHER RESEARCH LAB., INC.
PALO ALTO CALIF.



John Sill Jowett Pupil

"Hey, You SKINNY BAG of BONES!"

the boys shouted at me only A FEW SHORT WEEKS ago

But look at me now, PAL...A TROPHY-WINNING ALL-AROUND HE-MAN as YOU can be SOON in *10 Thrilling Minutes a day.*

Yes! Today everyone admires John Sill's movie-star Champion BUILD His big mighty ARMS. His heroic CHEST. His broad BACK. His rock-like TORSO. His wide military SHOULDERS. His newly-won POPULARITY.

YOU can WIN this big 15" Silver Trophy as John Sill just did! Your Name on it.

Send me only 10c Like John Did— And get ALL 5 PICTURE-PACKED HE-MAN BUILDING COURSES and get also

Be A Winner at Anything YOU Tackle with Progressive Power-
SPORTS! JOB! SCHOOL! FRIENDS!

GEORGE F. JOWETT "Champion of Champions"

FREE! Jowett's Photo Book of Famous Strong Men!

JOWETT INSTITUTE, Dept. PS-110
230 Fifth Avenue, New York 1, N. Y.

Dear George: Please mail to me prepaid FREE, Jowett's Photo Book of Strong Men, plus all 5 Muscle Building Courses, "How to Become a Muscular He-Man." ENCLOSED FIND 10c in complete payment for EVERYTHING.

NAME.....AGE.....
(Please Print Plainly, Include Zone Number)
ADDRESS.....NO C.O.D.'s
CITY.....ZONE & STATE.....

Ball-Bearing SPEED WHEELS

Dealers, Jobbers, and Manufacturers! Our new prices will interest you.

JUVENILE WHEELS (No bearing, solid tires)

4"	40c	6"	65c
5"	45c	7"	75c

(Semi-pneumatic tire, ball bearing)

8 x 1.25	1.85	10 x 1.25	2.20
8 x 1.75	1.95	10 x 1.75	2.30
8 x 2	2.20	10 x 2.00	2.65
		12 x 1.75	3.45

INDUSTRIAL WHEELS

Lug Base, Semi-Pneumatic tire

5 x 1.75	3.65	10 x 2.00	6.10
6 x 2 SW	3.45	10 x 2.75	5.15
6 x 2.00	4.00	12 x 2.00	6.90
8 x 2.00	5.20	12 x 3.00	9.20
8 x 2.50	5.40	16 x 4.00	15.15

Smooth Base, Pneumatic tire and tube

8 x 3.00	11.00	12 x 4.00	12.10
10 x 2.75	6.80	4.00 x 8	13.10
10 x 3.50	10.55	14 x 4.50	13.40

Available Now—CASTERS
Write for circulars on all wheels.
No c.o.d. orders. Prices F.O.B. our plant.

JIM BROWN TOY COMPANY
1093 HOME AVENUE **AKRON 10, OHIO**

Copyrighted material

Sensationally NEW for 1952!

MIDWEST TELEVISION

A Magnificent New Line of Beautiful CONSOLES and Complete CHASSIS featuring the Mammoth

20-Inch

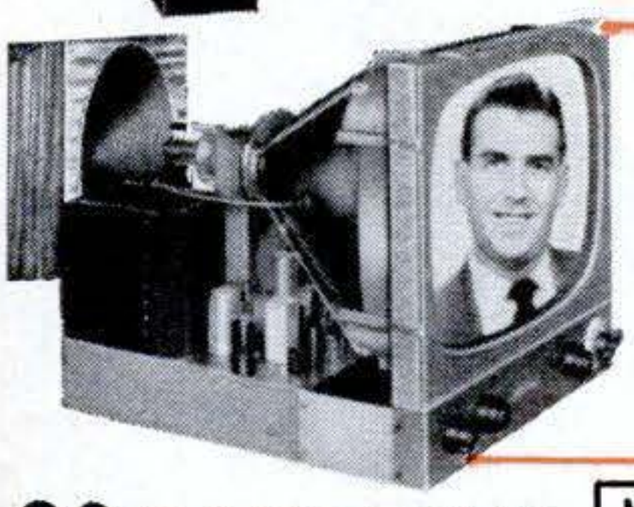
RECTANGULAR PICTURE TUBE

FACTORY-TO-YOU

THE New 1952 MIDWEST **"VIDEO GRAND"**

20-Inch TELEVISION-RADIO-PHONO CONSOLE

In addition to its mammoth 20-Inch Rectangular Picture, this luxurious instrument offers a powerful, long-distance AM-FM Radio *plus* the newest-type 3-Speed Automatic Intermix Record-Changing Phonograph.



MIDWEST 20-Inch TELEVISION CHASSIS and SPEAKER
—for easy installation in your own cabinet.

30 DAYS TRIAL

New 1952 MIDWEST **"CONSTELLATION"** 20-Inch TELEVISION CONSOLE

WRITE or PHONE
For This *NEW* 1952
FREE MIDWEST TELEVISION RADIO CATALOG

If You Live In One of These Cities Phone and Ask for Your Catalog

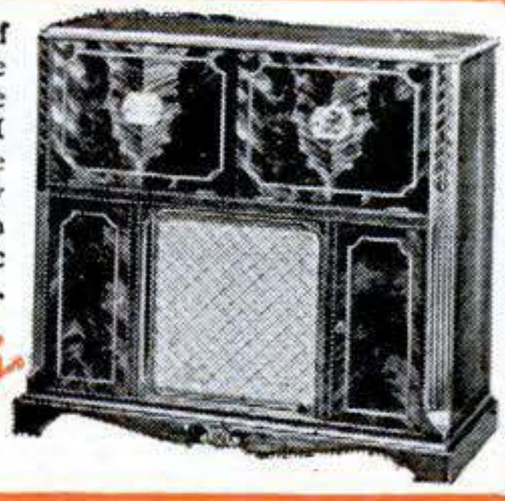
NEW YORK MUrray Hill 2-6810
CHICAGO STate 2-5600
PITTSBURGH GRant 1-0609
CLEVELAND PRospect 1-7450
DETROIT WOodward 3-1233
ST. LOUIS GRand 1161
PHILADELPHIA LOcust 4-1035

or Send Coupon Below

Also—Powerful New 1952 World-Ranging
MIDWEST Series of RADIOS
For Beautiful Consoles and Complete Chassis

An entirely new line of radios featuring the powerful Series 16 five wave band AM-FM Radio Chassis and the magnificent Symphony Grand Radio-Phonograph with 3-Speed Automatic Intermix Record Player.

Easy Terms



MIDWEST RADIO & TELEVISION CORP.
DEPT. 243, 909 BROADWAY, CINCINNATI 2, OHIO

• WRITE IN NAME AND ADDRESS (PLEASE PRINT) ON COUPON OR 1c POSTCARD •

MIDWEST RADIO & TELEVISION CORP.
Dept. 243, 909 BROADWAY • CINCINNATI 2, OHIO

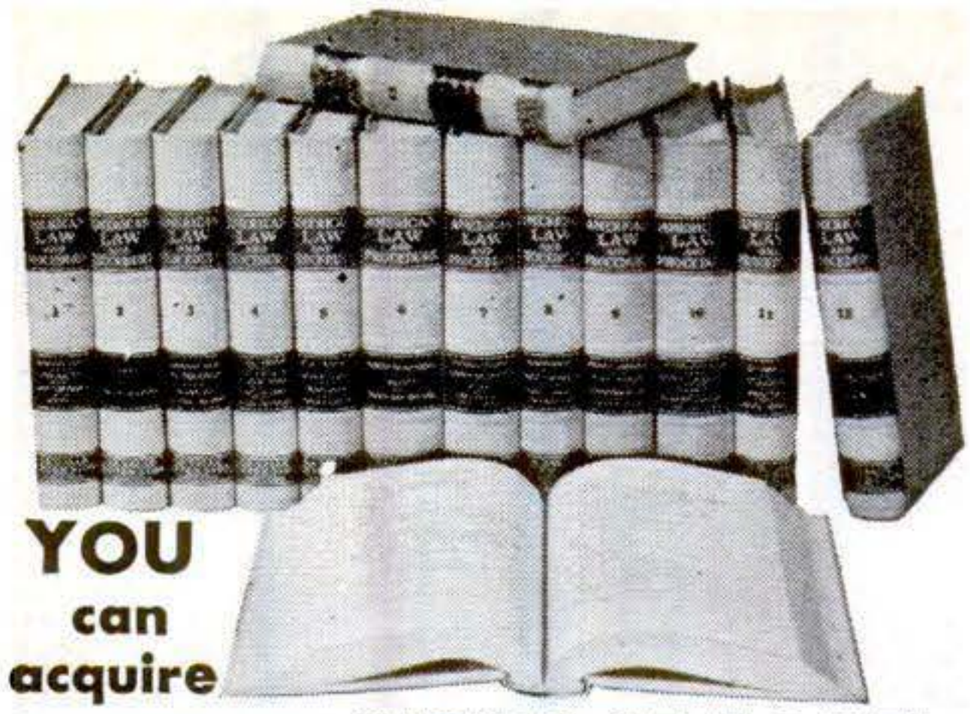
Please send me your new FREE 1952 Catalog.

NAME _____

ADDRESS _____

CITY _____ ZONE ____ STATE _____

Copyrighted material



YOU can acquire

LAW NIGHTS AT HOME! L.B. DEGREE

LaSalle's famous Law Library—used as reference in many Law libraries and Law offices—has enabled thousands to master Law surprisingly fast, in spare hours at home, for business and professional advancement.

These 14 remarkable volumes, compiled by leading professors and lawyers, cover the whole basic field of Law in condensed, orderly, simplified manner.

You advance rapidly with this great library, plus special lectures furnished. We guide you step-by-step with personalized Problem Method of instruction . . . you *learn by doing*—handling legal problems—not by memorizing rules.

Send for two FREE 48-page booklets, "Law Training for Leadership," and "Evidence," answering questions about Law and its value to you, and telling how LaSalle Law graduates are winning rapid advancement in business and public life. Mail coupon below. No obligation.

LA SALLE EXTENSION UNIVERSITY
A Correspondence Institution
417 S. Dearborn St. Dept. 1083L Chicago 5, ILL.

Send me your two FREE booklets described above, without obligation.

*Name*_____ *Age*_____

*Street*_____

*City, Zone & State*_____

Prepare Now!

ENGINEERING
B.S. DEGREE IN 27 MONTHS

WORLD FAMED SCHOOL · ESTABLISHED 1884

Mechanical, Civil, Electrical, Chemical, Aeronautical, Radio (Television) Engineering, Business Administration and Accounting. Also 36-weeks diploma courses in Surveying and Drafting.

Personalized instruction. Accelerated courses. For ambitious earnest students. Preparatory department.

Graduates in Demand. Hold positions of responsibility the world over. Placement service. Future shortage of engineers indicated. Prepare now, for the civil and military opportunities ahead.

Extensive campus. Well equipped, modern buildings and labs. Low cost. New terms start quarterly. Enter January, March, June, September.

Mail Coupon Today

TRI-STATE COLLEGE
5101 College Avenue, Angola, Indiana

Please send me free catalog and special information. I am particularly interested in courses as checked.

☐ Mechanical ☐ Civil ☐ Electrical ☐ Chemical ☐ Aeronautical
☐ Radio (Television) ☐ Business Administration ☐ Accounting
☐ Short Diploma Courses

NAME.....

ADDRESS.....

If You Own a Schick or Remington Electric Razor . . .

You get a closer shave and greater comfort by preparing your face before you shave. In just three seconds this wonderful lotion "sets up" your face for shaving.

1. **It evaporates sticky, razor-clogging perspiration.**
2. **It lubricates the skin for faster, more comfortable shaving.**
3. **It tautens your skin—"brings out" beard for closer shaves.**

It also lubricates shaver's cutting head for easier action, longer shaver life!

That's Lectric Shave. Only 49¢, plus tax, for 3 oz.—80 shaves. Use with any make shaver. For a free month's supply send name, address to The J. B. Williams Co., (PS-7), Glastonbury, Conn.

Opportunity OF A LIFETIME!

SELL AIR CUSHION SHOES

Write for FREE catalog today!

Build a permanent "repeat business of your own" without one penny of investment! Spare time pays big money! Sell John Neil Air-Cushion Shoes Direct from famous New England factory. Firestone Foamex cushions — complete line of men's dress, work, safety shoes! DuPont Neoprene non-marking soles, Women's and children's shoes. Fast deliveries from our mammoth stock department.

Earn up to $30.00 per day!

JOHN NEIL SHOE CO.
Dept. 750 - Brockton 64, Mass.

Money In Hamsters

The new wonder animals from Syria. Often called Toy Bears. Delightful pets. Everyone wants them. Laboratories use thousands. Clean, odorless. Raise anywhere. NOW, spotted and golden breeds. We furnish breeders, equipment and manual of instructions. Write today for free illustrated literature.

GULF HAMSTERY 1540 BASIL ST., MOBILE 17, ALA.

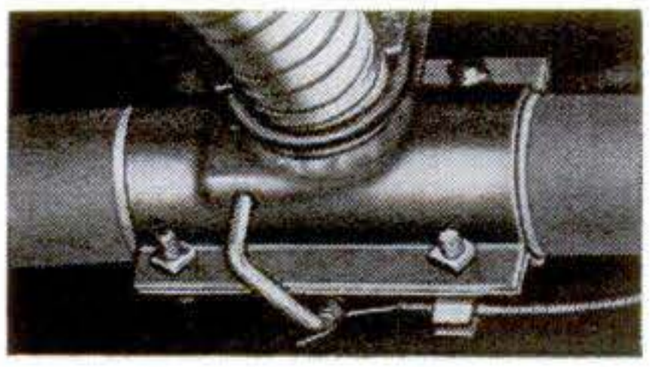
Stylecraft NEW

LEATHERCRAFT PATTERNS & KITS

Complete stock of high quality leathercraft supplies. **4 new handbag patterns**—tracings—photo patterns—and complete instructions—$1.50 postage prepaid.

Send 25c for new catalogue (Refunded with first order)

APACHE LEATHER CO.
Dept. PSX2
2804 E. Washington St., Phoenix, Arizona



HURRICANE EXHAUST CUT-OUT

This specially engineered cut-out enables you to install special pipes and mufflers without removing the original muffler.

Now control your exhaust tone from a dash control button. Cut back into your original muffler in restricted areas at will.

This cut-out is well constructed; actually strengthens exhaust pipe; made of heavy plate steel, designed for easy installation—no special tools required. Fits all exhaust pipes from 1¾" to 2¼" size. Sent postpaid for only $6.95 check or money order. Satisfaction guaranteed or your money back.

ST. LOUIS PRODUCTS CO., Box 24-B, Normandy 21, Mo.

Copyrighted material

WOULD YOU LIKE TO GET PAID FOR "GIVING AWAY" FIRST QUALITY FULL FASHIONED NYLONS AT 49¢?

REPLACEMENT OR REFUND OF MONEY
Guaranteed by Good Housekeeping
IF NOT AS ADVERTISED THEREIN

Imagine the money you can make! Sounds impossible, but that's all they cost if they run or snag within guarantee period up to THREE WHOLE MONTHS! What's more, this amazing low cost INCLUDES your commission, huge bonus and even the postage! Here is a miracle come true!

This isn't selling. It's giving something away. Yet, YOU get paid for doing it! Yes, you not only pocket an advance liberal cash commission but can easily earn a big bonus that increases your earnings up to 40%.

Women today buy over TWO MILLION PAIRS of nylons EVERY DAY. Many women average a pair a week. Stockings are bought more often than any other type of wearing apparel. Think how delighted any woman would be to learn about the amazing Kendex nylons.

It makes no difference whether you ever sold before or not. We don't care if you are 18 or 80—whether you have one hour or 50 hours a week to spare. You can make a wonderful steady income either full or spare time.

There is nothing for you to buy or deliver. You don't risk a dime. Pay nothing now or later. Just mail the coupon, that's all. We'll send you FREE SAMPLE STOCKING and complete money-making outfit postage prepaid. Show women how they can save at least half of their hosiery cost and write orders. We deliver and collect. Could anything be easier? If you don't make money quicker and easier than you ever did, throw the whole works away! Can we say more?

KENDEX

CORPORATION

BABYLON 949, N. Y.

FREE SAMPLE STOCKING

Date.....

Kendex Corporation
Babylon 949, N. Y.

Send me, absolutely free and postage prepaid, your complete money-making outfit including free sample stocking. It is understood I am under no obligation and if I am not satisfied with the money I make, I will throw away the whole outfit.

Name.....

Address.....

City.....Zone.....State.....

.....

Copyrighted material

DRIVE RELAXED WITH "LEFTY"

Dealers & Agents Wanted

LEFT-FOOT ACCELERATOR

Stop leg and back fatigue! Make long drives seem short! Now you can switch from right to left foot gas feed at will!—with LEFTY. Discover for yourself the comfort and convenience of the new "LEFTY" left-foot accelerator. Install "LEFTY" yourself in 60 seconds with just a wrench—no alterations to your car are necessary. Does not interfere with light switch or regular accelerator, clamps securely to steering column. Fully guaranteed. Safety engineered. All parts and fittings included with complete instructions. Bring your car up to date—make driving a real pleasure, especially on long trips. Thousands already in use. Don't delay! Send check or money order today. Only **5.95** Post-paid

FITS NEW CLUTCHLESS MODELS

Specify Year and Make of Your Car when Ordering. No COD's, please.

ORDER BY MAIL

INVENTORS MARKETING LAB

401-C De Young Building, 690 Market St., SAN FRANCISCO 4, CALIFORNIA

ENGINEERING DEGREE IN 27 MONTHS

Big Demand for Graduates

AERONAUTICAL, CHEMICAL, CIVIL, ELECTRICAL, MECHANICAL and RADIO ENGINEERING (including Television).

Hundreds of young men are earning engineering degrees in this recognized institution each year—continuous operation. New terms start quarterly. Many students earn a major part of their college expenses in this large industrial center.

Low tuition. Competent instruction. Thorough, intense, practical program. Modern laboratory facilities including new physics lab. and modernized wind tunnel. Individualized instruction emphasized.

Approved for Veterans. Engineering preparatory courses. Students from 48 states and 21 foreign countries. Enter December, March, June, September. Send coupon for free catalog and full information. Enroll now.

SEND COUPON TODAY

INDIANA TECHNICAL COLLEGE
6101 E. Washington Boulevard
Fort Wayne 2, Indiana

Please send me free information on B. S. Engineering degree in 27 months as checked.

☐ Aeronautical, ☐ Chemical, ☐ Civil,
☐ Electrical, ☐ Mechanical, ☐ Radio-Television.

Name.....

Address.....

EASY TO WORK WITH!

FOAM RUBBER

DO IT YOURSELF AND

SAVE 50%!

Your money back if you aren't satisfied with the perfect Foam Rubber! Recushion chairs, make your own pillows, mattresses, chair-pads, cushions! You'll save up to 50%—because you buy direct! **SEND FOR FREE PRICE LIST.** No C.O.D. Add 10% for postage and handling.

Shaped to fit
AUTO SEAT TOPPER PADS
24x60x1½"..$6.45
24x60x2" ... 7.95

16 x 16 x ½"	60c
16 x 18 x 1"	$1.10
16 x 16 x 1½"	1.30
18 x 24 x 1½"	2.00
24 x 24 x 1½"	2.95

FOAM RUBBER PRODUCTS
1136 Belmont Ave. • Chicago 13, Ill. Dept. PS-10

2 WAY WALKIE TALKIES!

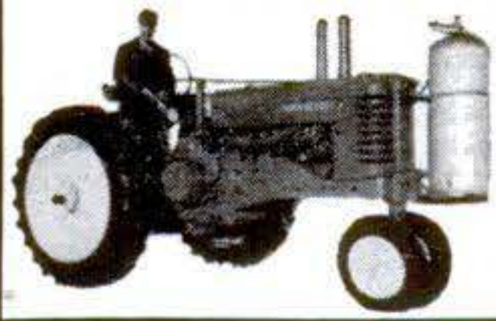
POCKET SIZE —ELECTRONIC VOICE POWERED

No tubes, batteries, adjustments, license or permit needed! Guaranteed to work anywhere up to ¼ mile with extra wire. **Swell for room to room—garage to house, etc! Your own private, talk-listen phone. Not war surplus. Brand new. Guaranteed. Two complete units with wire —READY TO USE!**

SEND $1.00 (ck Bill, mo) and pay postman $3.99 plus postage charges or send $4.99 for postpaid delivery. **Limited Supply.**

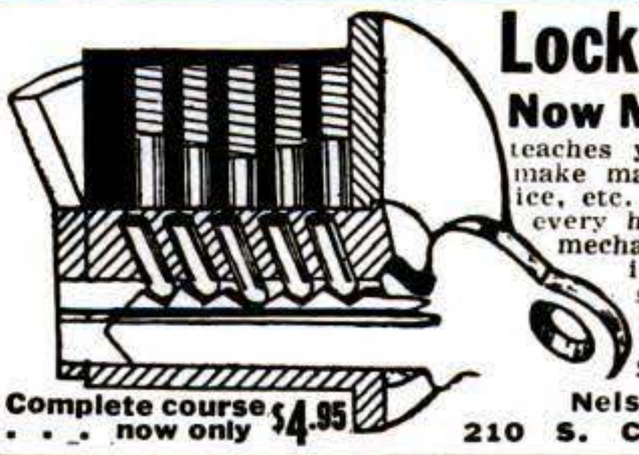
THE MIDWAY COMPANY, Dept. WPS-10, Kearney, Nebraska

PROPANE GAS ON YOUR CAR



with normal operation on gasoline. Switch to either instantly—Save up to ½ on fuel. **SEND $2.00** for "How-to-do-it" booklet, photos, drawings and low prices on complete outfits. (Refunded on parts order.) Rush order today NOW!

LPG PRODUCTS
Dept. PS-10 Kearney, Nebraska



Locksmithing AND KEY MAKING

Now Made Easy! Practical up-to-date course teaches you how to pick locks, de-code, make master keys, repair, install, service, etc. New self-instruction lessons for every handyman, homeowner, carpenter, mechanic, service station operator, fix-it shop, hardware dealer, gunsmith. 53 easy illustrated lessons. Full price only $4.95, postpaid; or C.O.D. plus postage. Satisfaction or refund guaranteed.

Complete course . . . now only $4.95

Nelson-Hall Co., Dept. K-1
210 S. Clinton St., Chicago 6, Ill.

"YOU ARE UNDER ARREST!"

Help Bring Crooks to Justice Through Scientific

CRIME DETECTION!

We have taught thousands this exciting, profitable, pleasant profession. Let us teach you **in your own home.** Learn Finger Printing, Firearms Identification, Police Photography, Secret Service Methods thoroughly, quickly, at small cost. Over 800 of all American Bureaus of Identification employ I. A. S. students or graduates. We can prepare you for this fascinating work during spare time. Write today, **stating age,** for "Blue Book of Crime."

INSTITUTE OF APPLIED SCIENCE, 1920 Sunnyside Ave., Dept. 1367, Chicago 40, Ill.

Free Book on Arthritis And Rheumatism

HOW TO AVOID CRIPPLING DEFORMITIES

An amazing newly enlarged 44-page book entitled "Rheumatism" will be sent free to anyone who will write for it.

It reveals why drugs and medicines give only temporary relief and fail to remove the causes of the trouble; explains a proven specialized non-surgical, non-medical treatment.

You incur no obligation in sending for this instructive book. It may be the means of saving you years of untold misery. Write today to The Ball Clinic, Dept. 36, Excelsior Springs, Missouri.

Copyrighted material

SAVE 40 TO 72% on Nationally Advertised Watches

A Jet-O-Matic Full Swing SELF WINDING 24.95

Super De-Luxe Model—360° **FULL-SWING AUTOMATIC.** Just set it—then forget it! It winds itself as you wear it. Patented **INCABLOC** 17 Jewel movement of superb accuracy. **WATER & SHOCK RESIST**—you can **drop** it, **bang** it, even **SWIM** with it! 100% stainless steel screw-back. Radium Luminous Markings. Unbreakable Kleersite Crystal. Hairline sweep-second. **SPLIT-SECOND** calibration for precision timing. Handsome thin case. Smart. **GILT** numerals & hands. **CAUTION:** Do not confuse with inferior **180° HALF swing** automatics! Thoresen's Jet-O-Matic is **360° FULL swing.** It's the "high compression" self-winder! Formerly **$75.00.** NOW—24.95 plus 10% tax—total **27.45. FLEX-METAL** band given!

FREE 10 DAY TRIAL

Check watches wanted in coupon below. Remit check or money order for **FAST** prepaid delivery, or order **COD** plus postage. Try, appraise, enjoy 10 whole days. Full price back **QUICK** if not delighted!

UNLIMITED GUARANTEE

Exclusive of Parts! No charge ever for skilled labor, "handling," etc. for **LIFETIME** of business. All **THORESEN** watches subjected to 11 special tests before shipment. Save with **SAFETY** . . . the **THORESEN** way!

CAUTION: Beware of unscrupulous operators offering **"UNREDEEMED" SECOND HAND** watches or **"SURPLUS" defective** watches. All Thoresens are **brand new,** recently arrived from gigantic Swiss factories.

Genuine Recipro-Register CHRONOGRAPH

The **ONE** and **ONLY** genuine **Recipro-Register CHRONOGRAPH**—computes speeds & distances down to 1/5 of second! **INCABLOC** 17 Jewel Movement resists shocks of work & play. Remembers for you while movement continues to keep time! **TIMES:** Races, Planes, Sports, Photography, Shop Work, Lab Experiments, Lightning, etc. **AUTOMATICALLY!** 3 multi-function synchronized dials. Contact clutch starts computation. Brake clutch freezes result. Also **ERASES** back to zero. Radium dial, hairline sweep-second, all stainless steel back, unbreakable **Kleersite** crystal. Don't confuse with cheap, troublesome chronographs. Every **Recipro-Register Chronograph** is **INCABLOC** equipped — subject to 11 gruelling tests before shipment! Formerly **$79.95. NOW**—27.25 plus 10% tax—total: **29.98.**

B De-Luxe 17 Jewel Gold Plate ACCURACY 14.00

MASTERPIECE of superb styling! Streamlined 14 karat Rolled Gold Plate—stainless steel back. Gilt numerals & hands, Hi-Dome crystal. Amazing accuracy! One of the smartest watches today. Formerly **$59.50.** Now yours for only 14.00 plus 1.40 tax—total **15.40.**

REVOLVO-CALENDAR 17 JEWELS

Tells month, weekday, hour, minute and second **INSTANTLY!** Triumph of Swiss craftsmanship...uses new, patented **REVOLVO** dial principle. Amazingly accurate! Luminous dial. Unbreakable crystal. Stainless steel back. Use for work or sports! Protected against shocks, dropping, etc. by world-famous **INCABLOC** shock absorber. Challenges comparison with **ANY** watch selling for $50.00. Terrific value! Only 17.95, plus 10% tax, total: **19.75.**

E 17.95

C 17 Jewel INCABLOC 14.95 WATER & SHOCK Resist

World famous **INCABLOC!** Radically different! 17 Jewels! You can **DROP** it . . . **WET** it . . . **BANG** it! Actually runs **UNDER WATER!** Try it at our risk. **De-Luxe Features:** Radium-applique numerals — Stainless Steel Screw Back—SafeGuard Gasket—Sweep-second—Thin. **GIVEN:** Vita-Flex band. Why pay up to $65.00? Thoresen's sacrifice price—14.95 plus 10% tax, total: **16.45.**

THORESEN DIRECT SALES, Dept. 7M-100
131 WEST 33rd STREET — NEW YORK 1, N. Y.

RUSH watches checked on **10 DAY FREE TRIAL.**
Remittance enclosed—send Prepaid. ☐ Send **COD** plus post. ☐
A ☐ B ☐ C ☐ D ☐ E ☐

NAME.....

ADDRESS.....

TOWN.....STATE.....

$49.95 SW-54

COMPACT TABLE RADIO BRINGS IN STATIONS FROM ALL OVER THE WORLD!

Tunes all shortwave radio stations (code or voice) from 540 kcs. to 30 mcs., including the standard broadcast band. Hear stations from London, Moscow, South America, etc., as well as radio amateurs, ships, police and airports. Made by the world's foremost maker of *professional* radio receivers. Write for complete details and name of nearest supplier.

NATIONAL COMPANY, Inc.
61 Sherman St., Malden, Mass.

CHOOSE AS YOUR COLLEGE CAREER

ELECTRICAL ENGINEERING

★ **MAJOR IN ELECTRONICS OR POWER**
★ **B.S. DEGREE IN 36 MONTHS**

Career opportunities are at an all-time high in Electronics. Prepare now for engineering employment opportunities predicted for 1954. This 48-year-old College of Electrical Engineering offers a proven plan to prepare you for a successful future.

Become a Radio or Electronics Technician in 12 Months. Prepare for a wide range of career objectives. *In 6 additional months become a TV Technician.*

YOUR TECHNICIAN'S COURSES APPLY FULLY TOWARD YOUR B. S. DEGREE . . . also complete in themselves. Military, practical, or prior academic training evaluated for advanced credit. B. S. Degree in 36 months.

MILWAUKEE SCHOOL of ENGINEERING

MILWAUKEE SCHOOL OF ENGINEERING PS-1051
1025 N. Milwaukee, Milwaukee, Wis.

Without obligation, send 1951 Catalog for Electrical Engineering, B. S. Degree, major in ☐ Electronics ☐ Power; plus Occupational Guidance Bulletin in: ☐ Radio-TV ☐ Electrical Power ☐ Welding ☐ Heating, Refrigeration, Air Conditioning.

Name..... Age.....

Address.....

City..... Zone..... State.....

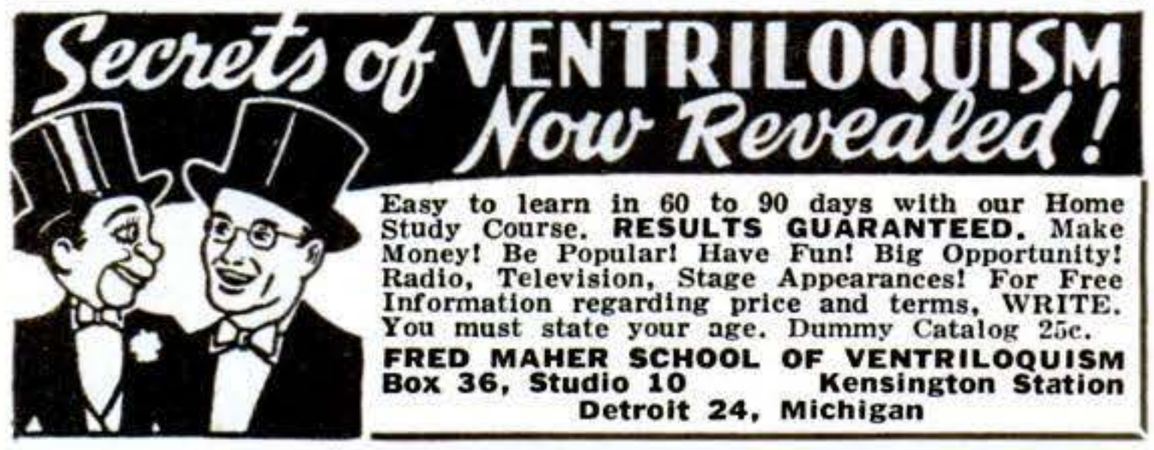
If veteran, indicate date of discharge.....

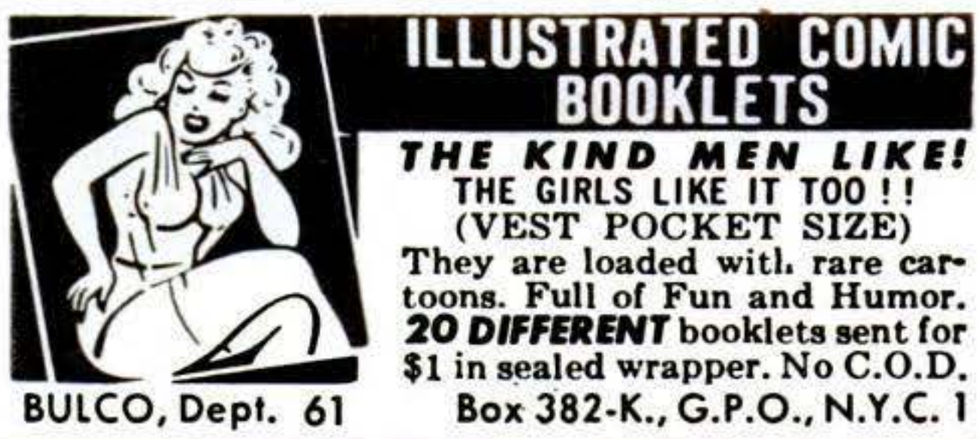
Copyrighted material

REALLY BIG MONEY

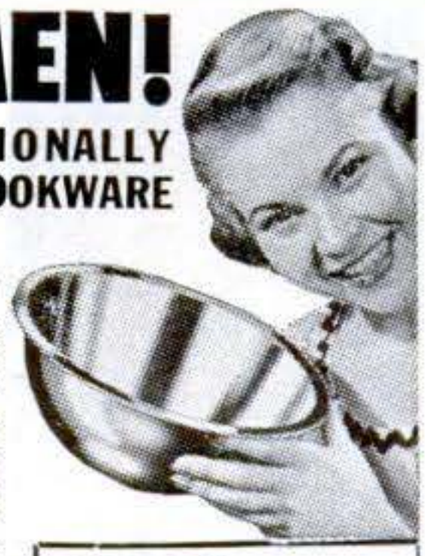
FOR A MAN OVER 30

Look at these figures: C. H. Libbey has averaged $13,540.00 per year with us the past 5 years! W. D. Michael earned $16,219.91 during 12 months. John Longnecker made over $2,000 in 2 months. Many others regularly earn $5,000 and more a year. This big money opportunity is open to a man who is mature, over 30 and willing to work a full 8 hours a day. No investment required. If this is the kind of an opportunity you want, write me today. Vice-President, Dept. J-10, Box 789, Fort Worth 1, Texas.





MEN! WOMEN!



TAKE ORDERS FOR NATIONALLY ADVERTISED WATERLESS COOKWARE

Big Money Full or Spare Time Starting a Carlton Cookware Club

Big earnings daily taking fast orders for amazing new kind of Stainless Steel Waterless Cookware under Sensational Plan that makes it easy for every housewife to buy. Club privileges permit your customers to get Matched Sets of CARLTON WARE without missing the money—on sensational new Easy Payment "ADD-A-PIECE" Plan—PLUS up to $8.00 worth of **gift bonuses.** No experience needed. We show you everything—supply everything FREE. Earnings start at once. Rush name and address. Be First!

FREE! 20-Use Set of Stainless Steel Cookware Given As a Bonus

CARLTON OF CARROLLTON, Dept. 27-S, Carrollton, Ohio

Say You Saw It In Popular Science

Play Piano with BOTH Hands *the FIRST Day—or Don't Pay!*

AMAZING, NEW, PATENTED SELF-TEACHING DEVICE GIVES "SECRET"

You, too, can play piano with BOTH hands, at once! Thousands have learned to play this fast, easy A-B-C way. With the amazing invention, the AUTOMATIC CHORD SELECTOR, there's nothing to it. This is no trick method. You actually read and play any sheet music. And, the Patented AUTOMATIC CHORD SELECTOR guides your fingers every note of the way. No scales, no exercise, no boring practice. You play the minute you sit at the piano. In no time at all you're playing Hit Parade numbers, or hymns, or beautiful old ballads . . . or all three! Send for this marvelous Dean Ross Piano Course today. Consists of 30 illustrated lessons, 50 songs with words and music, special Dean Ross play-at-once arrangements, and the Patented AUTOMATIC CHORD SELECTOR. Only $1.98 complete. You have nothing to lose and popularity and fun to gain, so mail the 10-Day FREE-TRIAL coupon now!

Dean Ross Piano Studios, Inc., Dept. E-6210
45 West 45th St., New York 19, N. Y.

Send Piano Course of 30 lessons, 50 songs, and Patented Automatic Chord Selector. On delivery will pay postman just $1.98 plus postage. If not delighted, may return Course in 10 days for purchase price refund. The Automatic Chord Selector is mine to keep.

☐ **SAVE MONEY! Send payment, we pay postage. Same guarantee.**

Name . . . . . .

Address . . . . . .

Copyrighted material

New Advertising Machine

Prints & Illustrates 1¢ Post Cards

FREE Learn *how* thousands of business men, in every line, are boosting sales in spite of conditions—with 1¢ messages—printed and illustrated in a few minutes on gov'nt post cards — with amazing new patented **CARDMASTER.** Your "today's" ideas, read by your prospects next morning. Not a toy, but a sturdy advertising machine, built to last for years. Low price, sold direct. Guaranteed for five years. Send name today.

SEND NAME We'll send **FREE** illustrated book of money-making IDEAS for your business and complete, unique advertising plans. RUSH YOUR NAME TODAY.

CARDMASTER COMPANY
1920 SUNNYSIDE, Dept. 1610, CHICAGO 40, ILL.

MAIL ORDERS • FREE DELIVERY
UNCONDITIONAL MONEY BACK GUARANTEE

Send for FREE WAR SURPLUS CATALOG

Feather SLEEPING BAG

DeLuxe Quality in Every Respect. Save about ½!

NEW! 2 AIR MATTRESS POCKETS. Fine grade, water repellant, weather proof khaki cover. Filled with soft, fluffy feathers for warmth, comfort. 2 Bags zip together to make Double Sleeping Bag. Head Flaps for wet weather. Heavy duty all-around zipper for easy airing. Double inner lining with plastic backing to keep out all cold and moisture. Rolls into easy-to-carry pack.

Polar Type. Large size 34 in. x 78 in.

$25 VALUE
$13.88 FREE DELIVERY

New! Kapok Filled SLEEPING BAG — $18.95 Value
Full size 34 x 78. 100% water repellant, plenty of Kapok filling, zipper opening. A top quality sleeping bag at a budget price. Money-Back Guarantee. **$11.79** Free Delivery

UNIVERSAL ENTERPRISES — 946 S. MAIN, LOS ANGELES 15, CALIF.

Yours to make and keep!

THIS FOOTSTOOL—BOUDOIR CHAIR AND LAWSON CHAIR!

LEARN UPHOLSTERING AT HOME

Upholstering needs more trained men for good, steady jobs! Now you can prepare for a better paying position —or your own business—with this practical home training course—by an accredited, established school, largest of its kind in the country!

YOU LEARN WITH REAL EQUIPMENT—YOU BUILD REAL FURNITURE—YOU GET A COMPLETE TOOL KIT & ALL MATERIALS. ALL AT NO EXTRA COST!

FREE! Big, illustrated brochure, sample lessons and details of "PAY AS YOU LEARN" plan. No obligation.

SEND THE COUPON TODAY!

FIELD SCHOOL OF UPHOLSTERY, DEPT. PA
39 West 19th Street, New York 11, N. Y.
Rush FREE illustrated brochure, sample lessons and details of "PAY AS YOU LEARN PLAN."

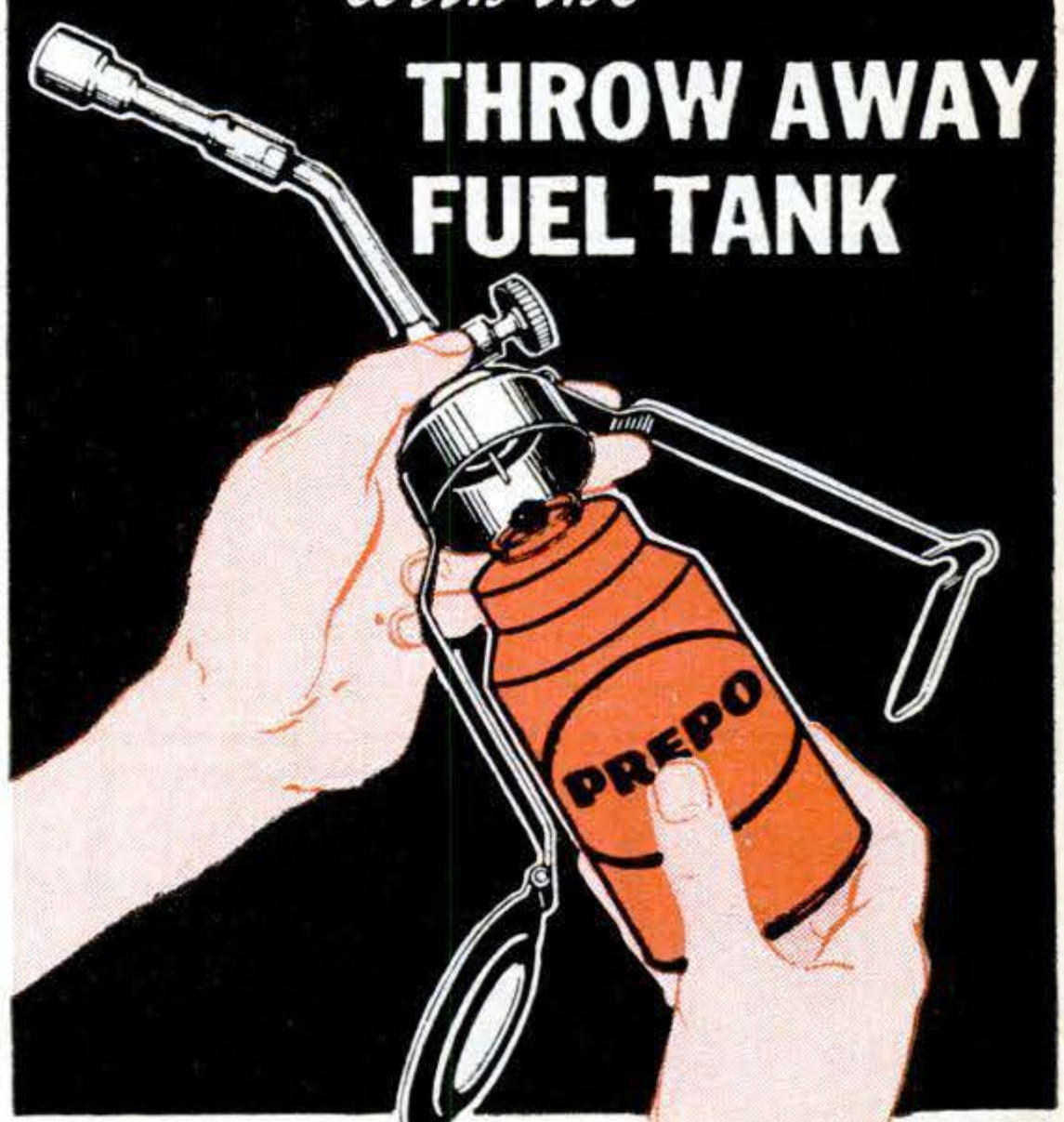
Name_____ Age____
Address_____
City_____ Zone____ State_____

Instant Flame with a Twist of Your Fingers!

PREPO

The new principle **TORCH** *with the*

THROW AWAY FUEL TANK



IT'S SAFE! ECONOMICAL CONVENIENT

No messing around with bulk fuel. No pouring, no pumping, no priming—Prepo gives you a hot blue flame, ready for soldering, removing paint or putty, or any of the many uses you expect from a torch. Prepo Fuel comes in throw away tanks—each good for several hours of steady work. Prepo is easy to use—fits your hand—weighs only a few ounces—puts 2200° F. flame where you want it. At your favorite store.

Four Models—All Using Same Tank of Fuel

Prepo Master Torch has two interchangeable burners, a pin-point burner for precision work, and a heavy-duty burner for larger work demanding a volume of heat. Designed to fill the needs of the demanding industrial user.

Utility Torch produces medium sized flame for average job around shop or home. Two other models feature the same burners as the master torch. Burners of the last three torches are fixed and are not interchangeable.

PRESSURE PRODUCTS CORPORATION
140 N. Dearborn Street Chicago 2, Illinois

Copyrighted material

Listen to this Record!

SPEAK FRENCH-SPANISH

RUSSIAN-GERMAN
ITALIAN-BRAZILIAN-JAPANESE

"Learn by Listening" to **CORTINA RECORDS—NEW RECORDINGS, UNBREAKABLE RECORDS.** Learn at home, the **NATURAL** way—quickly, easily, cheaply.

Only 15 Minutes a Day!

THOUSANDS have found it the most fascinating, most effective way to learn languages for **Pleasure, Business, Travel, Culture. INVESTIGATE!**

Send For FREE BOOK!

Illustrated 32-page book, "The Cortinaphone Short-Cut" sent **FREE.** Tells just what you want to know. **Interesting. Get it!**

Write Today--NOW

CORTINA ACADEMY (Est. 1882)
Suite 1210, 105 W. 40 St., N. Y. 18, N. Y.

Please send me—without obligation—your free book. I am interested in (check)

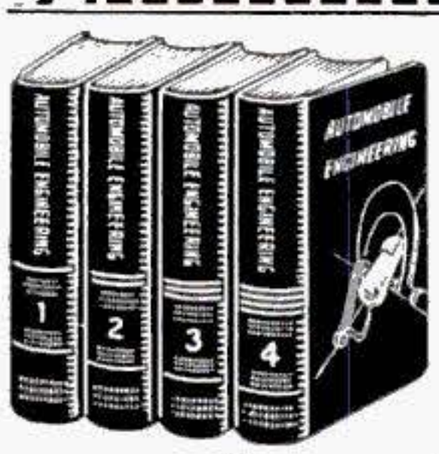
☐ **French** ☐ **Spanish** ☐ **German** ☐ **Italian** ☐ **Brazilian** ☐ **Russian** ☐ **Japanese**

Name.....

Address.....

City..... State.....

☐ **VETS!** Check if NOW eligible under G.I. Bill.



AUTO BOOKS ON APPROVAL

CAN YOU FIX IT?

These wonder books tell step by step HOW to make difficult repairs and adjustments, how to keep a car at maximum efficiency, including latest improvements in car design and operation. Engine troubles and how to correct them well covered.

4 BIG, THICK VOLUMES
Over 2700 pages, 2000 illustrations, wiring diagrams, etc. Beautiful modernistic, washable cloth binding.

SEND NO MONEY. Just mail the coupon for a complete set of 4 Big, Thick Auto Books, 20th Edition. Over 2700 Pages! Whether you are a mechanic or helper, expert or apprentice, auto owner or driver, take immediate advantage of this FREE EXAMINATION OFFER.

MAKE GOOD MONEY NOW
HOLD A PERMANENT JOB

America wants its automobiles kept in good repair. Men with "know how" are in demand, at big pay. These books will help you get and hold an important job, or give you a chance to go into business for yourself now or later. Any man who half tries to improve himself can learn auto servicing and repairing by this quick reference method. Use the JIFFY INDEX to find easily understood answer to any auto problem. These wonder books prepared by eleven of America's great automobile engineers. Many hundreds of valuable illustrations. Send the coupon TODAY.

[A year's consulting privileges with our engineers now given with these books without extra charge.]

Publishers Since 1898

AMERICAN TECHNICAL SOCIETY, Dept. A720
Drexel Ave. at 58th St., Chicago 37, Ill.

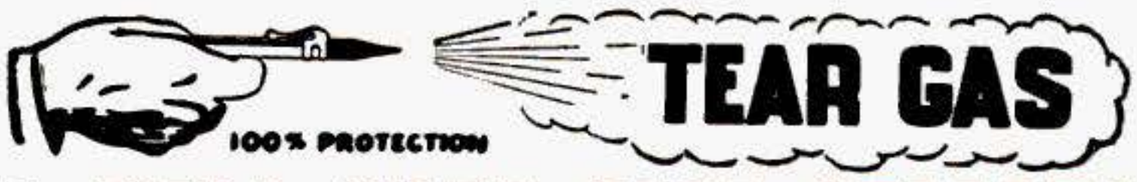
I would like to examine your 4 Volume Set of Auto Books. I will pay the delivery charges only, but if I choose I may return them express collect. If after 10 days' use I prefer to keep them, I will send you $3 and pay the balance at the rate of only $4 a month until $24.80 has been paid. Include consulting service as offered above.

Name.....

Address.....

City..... State.....

Please attach letter stating age, occupation, employer's name and address, and name and address of at least one business man as reference. Men in service, also please give home address.



A REAL SURE-FIRE SELLER!

THUGS AND THIEVES BEWARE!

Here is a tear gas pencil gun which discharges smothering clouds of tear gas to instantly stop, stun and incapacitate the most vicious man or beast. A safe and effective substitute for dangerous firearms. No permanent injury. Needed in Stores, Banks, Autos and Homes, everywhere to protect Life and Property. No skill required. Handle our tear gas as a side line and you'll soon give it full time. For a quick start send $4.25 for complete demonstrator outfit consisting of an Automatic Pencil Gun with 10 demonstrators and 3 powerful Tear Gas cartridges fully guaranteed. Many thousands now in use. Order your outfit today. Not sold to minors.

Hagen Supply Corp. Dept. A510 St. Paul 4, Minn.

MECHANICAL DENTISTRY

To make Crowns, Plates, Bridgework, etc., for Dentists. Easy practical way to learn mechanical dentistry at home in spare time. FULL EQUIPMENT OF TOOLS AND MATERIALS INCLUDED WITH COURSE. Low tuition. Easy terms. Write for FREE BOOK about this money making profession that is not affected by the machine age.

McCARRIE SCHOOL of Mechanical Dentistry
207 N. Broad Street Dept. 916 Philadelphia, Pa.

TREASURE -- $10,000

New locator detects metals, valuable minerals and buried treasure. Money-back guarantee of superiority.

Also geiger counters. Govt. reward of $10,000 for uranium discovery. Write for FREE information.

THE GOLDAK COMPANY
1544 W. GLENOAKS BLVD., GLENDALE 1, CALIF.

ANALYZE HANDWRITING

MORE INCOME, Prestige, Success. Fascinating uncrowded profession-business, full or spare time. FREE illustrated lesson & Year Book shows how men and women in home, business and professions analyze handwriting to **understand people,** MAKE MONEY. FREE lesson and information about unusual opportunities if over 21.

I. G. A. S., Inc., 715 Wilhoit Bldg., Springfield, Mo.

BATTERIES START A FACTORY AT HOME

—and re-cast junk batteries into new, with and without new materials; the latest achievement. We supply complete instructions and everything needed. Big profits daily!

BATTERY LABORATORY SCHOOL
DEPT. PSM, MINNEAPOLIS 4, MINNESOTA

The HOME CHEMIST

A new book which shows how to set up and operate an inexpensive home laboratory with odds and ends of material available in every home. Many thrilling, practical, useful experiments and tests, entertaining, instructive, valuable, pointing the way to research and new discoveries. Many diagrams and illustrations. Full cloth bound $1.49.

POPULAR SCIENCE MONTHLY, Dept. 1051
353 Fourth Ave. New York, N. Y.

GET INTO RADIO TELEVISION

& ELECTRONICS BY MASTER SHOP-METHOD HOME TRAINING

Let *National Schools*, of Los Angeles, a practical Technical Resident Trade School for almost 50 years, train you for today's unlimited opportunities.

LEARN BY DOING

You receive and keep all the modern equipment shown, including tubes and valuable, professional quality Multitester. No extra charges. You build the fine Superheterodyne Receiver with parts we send you.

YOU ALSO RECEIVE THIS MULTITESTER

WE SEND YOU ALL PROFESSIONAL EQUIPMENT

TODAY'S SHORTAGE OF TRAINED TECHNICIANS CREATES BONUS OPPORTUNITY FOR YOU!

Radio, Television, Electronics is a dominant factor in the national emergency. How well these essential services will do the big job they have been given depends upon the supply of trained men. Prepare yourself *now* to step into a good-paying job with a real future! New developments in color television, guided missiles, radar and other electronics fields are only the beginning! National Schools Master Shop-Method Home Training, with newly added lessons and equipment, trains you in your spare time for these fascinating opportunities. OUR METHOD IS PROVED BY THE SUCCESS OF NATIONAL SCHOOLS TRAINED MEN, ALL OVER THE WORLD, SINCE 1905.

TELEVISION TRAINING

A complete series of up-to-the-minute Television lessons is an important part of your course. They cover all phases of Television repairing, servicing and construction.

GET THESE 2 FREE BOOKS

No Charge or Obligation Use Coupon

NATIONAL SCHOOLS TRAINING IS COMPLETE

National training qualifies you for your choice of many job opportunities in radio and television broadcasting, manufacturing, servicing, sales. Also installation and maintenance of laboratory electronics equipment, sound systems, police radio, and many others. You can start a good paying business of your own, as many other National graduates have done!

EARN WHILE YOU LEARN. Early in your training, you receive Spare Time Work Lessons which will enable you to earn extra money servicing neighbors' and friends' Radio and TV receivers, appliances, etc.

NATIONAL SCHOOLS

Los Angeles 37, Calif. • Est. 1905

FIND OUT NOW...MAIL COUPON TODAY

National Schools, Dept. 10-PS
4000 South Figueroa Street
Los Angeles 37, California

Mail in envelope or paste on penny postal

Send me your FREE book "My Future in Radio-Television" and the sample lesson of your course. I understand no salesman will call on me.

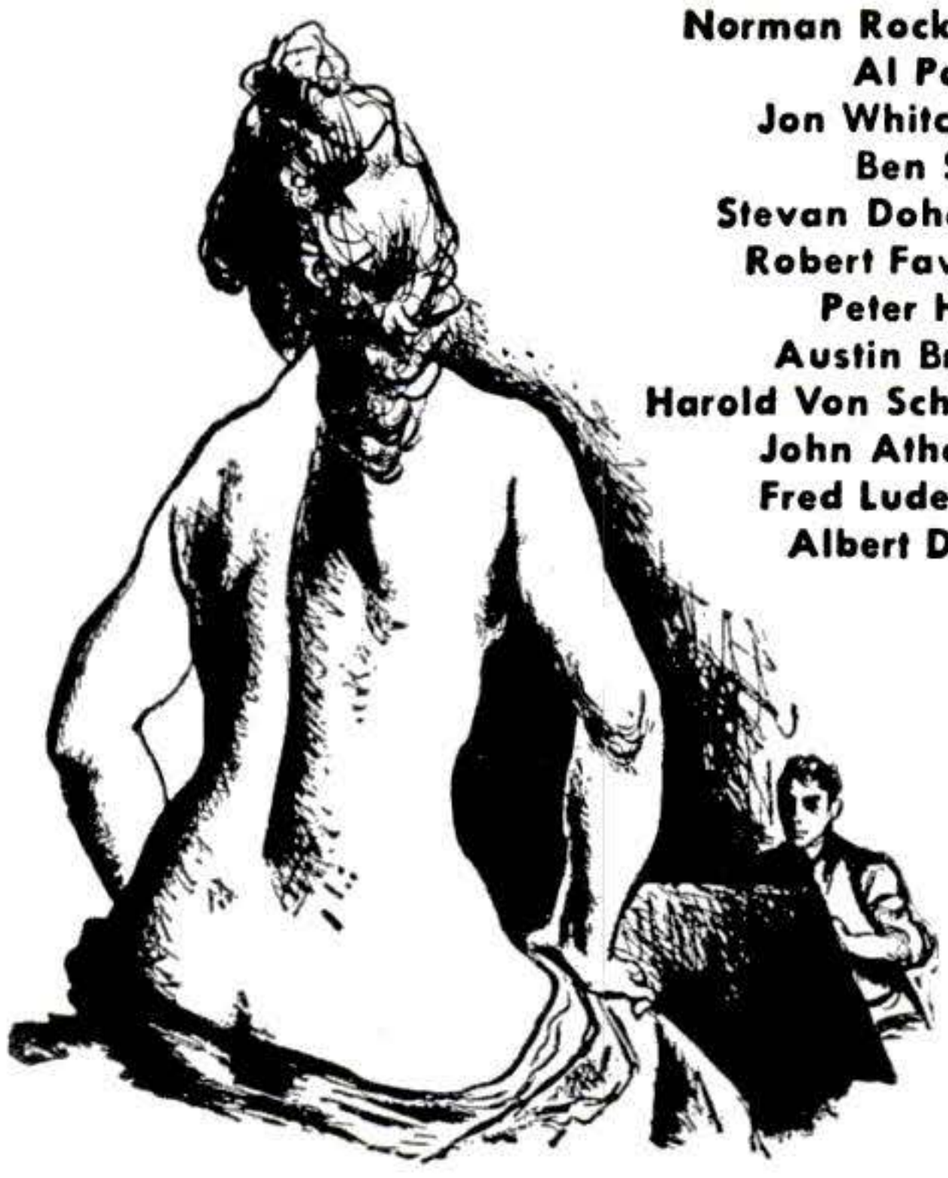
NAME_____ AGE_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

A FASCINATING...MONEY-MAKING art career can be yours

America's 12 Most Famous Artists Show You How!



Norman Rockwell
Al Parker
Jon Whitcomb
Ben Stahl
Stevan Dohanos
Robert Fawcett
Peter Helck
Austin Briggs
Harold Von Schmidt
John Atherton
Fred Ludekens
Albert Dorne

Now, for the first time, you can study art under the personal supervision of America's 12 most famous artists. And you learn at home, in your spare time! Write today for our handsome illustrated booklet that tells you all about it. **It's FREE—Write today!**

FAMOUS ARTISTS COURSE

FREE

Dept. 11-X, Westport, Conn.
Please send big illustrated booklet about my art career.

Mr. Mrs. Miss .....Age.....
(Please print)

Street .....

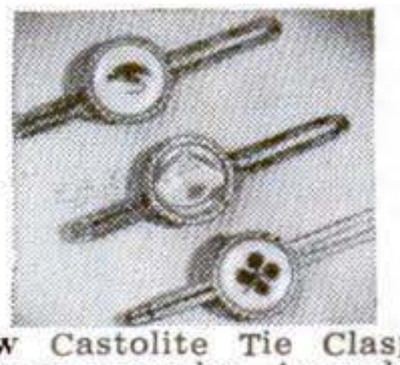
City, Zone, State .....

Copyrighted material

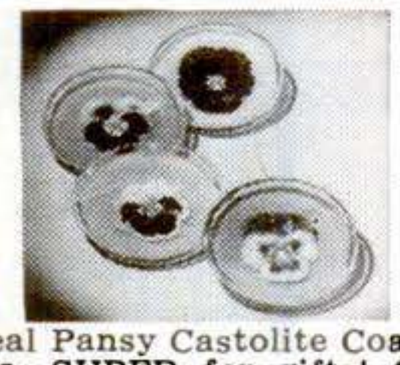
BRAND NEW way to make Extra Money at *Home*

Would $100.00 to $250.00 in EXTRA CASH come in handy between now and Christmas? If YES—then grasp this hand of opportunity to cash in on the great demand for these new, gorgeous eye-appealing Castolite Costume Jewelry Creations and Gift Articles that everybody likes and WANTS the minute they see them. Readers of Popular Science will like this offer!

This Cameo Necklace and Earring Set can be assembled at home. Fine profits in store for you!



New Castolite Tie Clasps are very popular. Assemble at home for extra big profits!



Real Pansy Castolite Coasters. SUPER for gifts! Get them finished or make at home.

Personal initial, fish fly and four-leaf clover Key Tags and Purse Pulls are "best sellers."

Get Big Profits before Christmas!

Castolite Creations come in both finished and unassembled form. Best of all, they are THEIR OWN SALESMEN. SHOW THEM to friends, neighbors, others and ACCEPT Big-Profit Christmas Gift Orders. Send 25c deposit for Catalog, Wholesale Price List and New Manual explaining our exciting proved Home-Profit Plan. Money returned if not delighted. HURRY! Write Today.

THE CASTOLITE CO. Dept. L-2, Woodstock, Ill.

LAW FREE BOOK

Your **FREE** copy of **"The Law-Trained Man"** shows how to gain prestige and greater earnings through Blackstone home law study. All instruction material furnished including 17-volume Law Library written by 65 well-known law authorities. Lawyers, judges among our graduates. LL.B. degree. Low cost; easy terms. Write today.

BLACKSTONE COLLEGE OF LAW Dept. 127, Chicago 1, ILL. 225 N. Michigan Ave.

A Correspondence Institution Founded in 1890

CHECK YOUR FUTURE

- ☐ AUTOMOTIVE MECHANICS
- ☐ BODY & FENDER REBUILDING
- ☐ DIESEL MECHANICS
- ☐ TELEVISION
- ☐ RADIO
- ☐ REFRIGERATION
- ☐ MECHANICAL DRAFTING
- ☐ BUILDING CONSTRUCTION
- ☐ UPHOLSTERING
- ☐ FOREMANSHIP
- ☐ FACTORY MANAGEMENT
- ☐ HIGH SCHOOL

MAIL TODAY!

If you don't like the way inflation and income taxes have hurt your income—if you want more pay—*mail this coupon today!* Learn how you can train *at home in spare time*—prepare for a successful career—in months! Man, you've *nothing* to lose! Do it *now!*

Commercial Trades Institute
1400 Greenleaf, Chicago 26, Dept. E1-10

Name_____ Age____

Address_____

City_____ State____

FOAM RUBBER

FOR HOBBYISTS, CRAFTSMEN, EXPERIMENTERS

Lowest Prices—SAVE 50%

16 x 16 x 1½"...ea.	**$1.35**
16 x 22 x 1½"...ea.	**1.75**
18 x 24 x 1½"...ea.	**2.00**
24 x 24 x 1½"...ea.	**2.95**

AUTO SEAT TOPPER PADS
Place under seat cover

24" x 60" x 1½".ea.	**$6.45**
24" x 60" x 2"...ea.	**7.95**
12" x 14" x 1½".ea.	**1.25**

Use for furniture cushion fillers, mattresses, Mattress pads, cushions. Foam Rubber is available in any size or thickness. Send For Free Price List. Immediate delivery. No C.O.D.'s. **Add 10% for Postage & Handling to Above Prices. Please print.**

FOAM-KING RUBBER CO., Dept. S-24
P. O. Box 2676, 1174 W. Monroe St., Jacksonville, Florida

BUILDING YOUR OWN

SPEEDBOAT

Every item of marine hardware from one source. The only single supplier in America of a complete line of marine hardware, fittings and racing equipment for full-race or pleasure hydros and runabouts. Write today, enclosing 25¢, for our big 32 page fully illustrated 1951 catalogue full of speedboat information, pictures and instructions.

I. E. DEBBOLD'S *MARINE SUPPLY CO.* 10366-S LONG BEACH BLVD. LYNWOOD 6, CALIFORNIA

REAL ESTATE — BE A BROKER

PAYS BIG! SEND FOR FREE, BIG, ILLUSTRATED CATALOG NOW! No obligation. Graduates report making substantial incomes. Start and run **your own business quickly.** Men, women of all ages, learn easily. Course covers Sales, Property Management, Appraising, Loans, Mortgages, and related subjects. **STUDY AT HOME** or in our classrooms in big cities. Diploma awarded. Nationally known. G. I. Approved.

FREE BOOK TELLS HOW

WEAVER SCHOOL OF REAL ESTATE (Est. 1936)
15 E. Pershing Road, Dept. PS, Kansas City, Mo.

Be a DETECTIVE

A CHALLENGE FROM WASHINGTON, D. C.
Help Stop Crime! Train at home. Earn big money. Amazing training course from the NATION'S CAPITOL (center of law enforcement) by former U. S. GOVT. AGENT and NAVAL INTELLIGENCE Officer exposes actual methods used by Criminals. Write for FREE BOOK. State age.

INTERNATIONAL DETECTIVE SYSTEM

INTERNATIONAL DETECTIVE TRAINING SCHOOL
1701 Monroe St., N.E. Dept. 2110 Washington 18, D. C.

NOW YOU TOO CAN BUILD 15 RADIOS

COMPLETE KIT $19.95

The Progressive Radio "Edu-Kit" is a Home Radio Course in kit form. No previous knowledge of radio is required. No additional parts necessary. Tools included. Easy-to-follow instructions. Theory, Practical Work, Trouble-shooting are taught. Used in many radio schools. Excellent background for television.

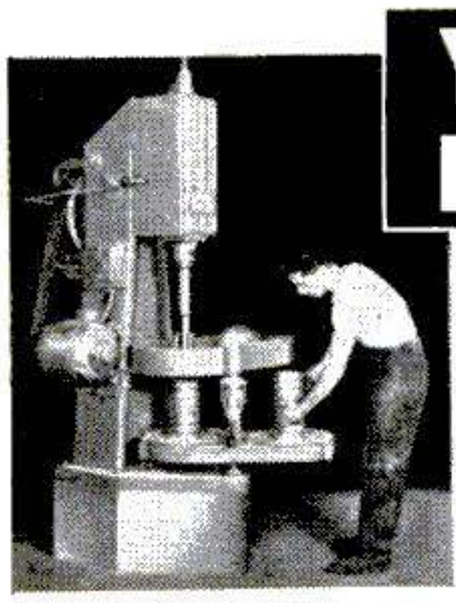
Kit includes all parts, instructions, radio tester, electric soldering iron, trouble-shooting guide, quizzes, television book, consultation service. $19.95 is complete price. Nothing else to buy. Everything you build is yours to keep. All parts and equipment guaranteed.

Order your kit today, or send for further information. You risk nothing. 10 Day Money-Back Guarantee.

Postage prepaid on cash orders. C.O.D. orders accepted in U.S.A.

PROGRESSIVE ELECTRONICS CO.
497 Union Ave., Dept. P.S.-1 Brooklyn 11, N. Y.

Copyrighted material



You Can Make DRAIN TILE

and Build a Profitable Community Enterprise

Farm drainage, home building, reclamation projects, highway construction. From these and other sources come the biggest demand for drain tile in history. More local plants are urgently needed.

Millions of dollars' worth of drain tile are used annually. Much of it, ordinarily, is shipped from far distant points. *Local* manufacturing is economical, logical, profitable. The Champion Drain Tile Machine makes manufacturing easy. Pares production costs. Requires no skilled labor. Makes all sizes from 3" to 12". Yet requires only a moderate investment.

Outstanding Manufacturing Opportunity

Champion-made cement tile are dense, strong, and truly round. No distortion, no shaling. Worth more than clay tile, but can be sold for less — and still leave a handsome profit margin.

Write for the DrainTile Book. Tells about cement tile as a local manufacturing enterprise. Tells about easy-payment terms. Write today.

Concrete Equipment Company
521 Ottawa Ave., Holland, Michigan E2

SAVE UP TO 50% AND MORE

OUT OF PAWN

VALUES FROM $10 TO $10,000

All diamonds reset in brand new modern mountings. Sold with a written iron-clad money back guarantee. Over 100,000 satisfied customers have bought diamonds from Berman's.
Our reference—your own bank or any mercantile agency.

Diamonds from estates, banks, unredeemed pledges offered at substantial savings

Berman's Diamond Loan Bank
Dept. PS —BERMAN BLDG., BALTIMORE 1, MD.

Watchmakers WANTED!

Learn this high-pay trade. Copyrighted Sweazey System shows you how . . . quickly, successfully . . . at home or in our Chicago School (founded 1908). We furnish tools, supplies, practice watches for home study course. No previous experience needed. Try it without obligation!

FREE SAMPLE Home Study LESSON

Approved resident courses include chronograph repairing, jewelry repairing, gem setting, and jewelry engraving. Write for full information.

CHICAGO SCHOOL OF WATCHMAKING
1608 N. Milwaukee Ave., Dept. 4101, Chicago 47, Ill.

☐ Send Free Sample Home Study Lesson.
☐ Send Free Catalog of Resident Courses.

NAME _____
STREET _____
CITY _____ ZONE ___ STATE _____

Make Money Selling SERVICE SHOES Direct to Fellow Workers!

THEY ALL WANT NEW AIR-CUSHIONED COMFORT

Would you like to earn from $15.00 to $60.00 a week EXTRA in spare time? Take orders for Consolidated's sensational service shoes — wanted *everywhere!* Sell to people where you work — to service station attendants, factory workers, barbers, waiters, to friends and neighbors.

17 SPECIAL TYPES

Now, a wonderful selection to choose from! Rugged Horsehide Shoes, Steel-Toe Safety Shoes, Gro-Cork Slip-Resistant soles, and the long-wearing Service Shoes, pictured above, with DuPont Neoprene Oil-Resistant soles and heels, and famous Velvet-Eez comfort features. Notice the special **air-cushion insole** and **instep arch support.** Marvelously restful for people who are on their feet a lot. Also, all kinds of Dress Shoes for men and women — sizes **4** to **16**, Widths **AAA** to **EEEE.** See how easy it is to make **extra cash** for yourself while helping fellow workers save money — everyone can afford to buy at our low direct-from-factory prices!

WE SHOW YOU HOW!

You don't need experience; we show you how to become successful! You get a **Free Selling Outfit,** and our famous Automatic Selling Plan that helps you make BIG MONEY from the first hour you start. Don't delay a minute — rush coupon now!

RUSH COUPON NOW

Guaranteed by Good Housekeeping — Replacement or Refund of Money if Not as Advertised Therein

CONSOLIDATED SHOE SYSTEM
Dept. CI-24 Chippewa Falls, Wis.

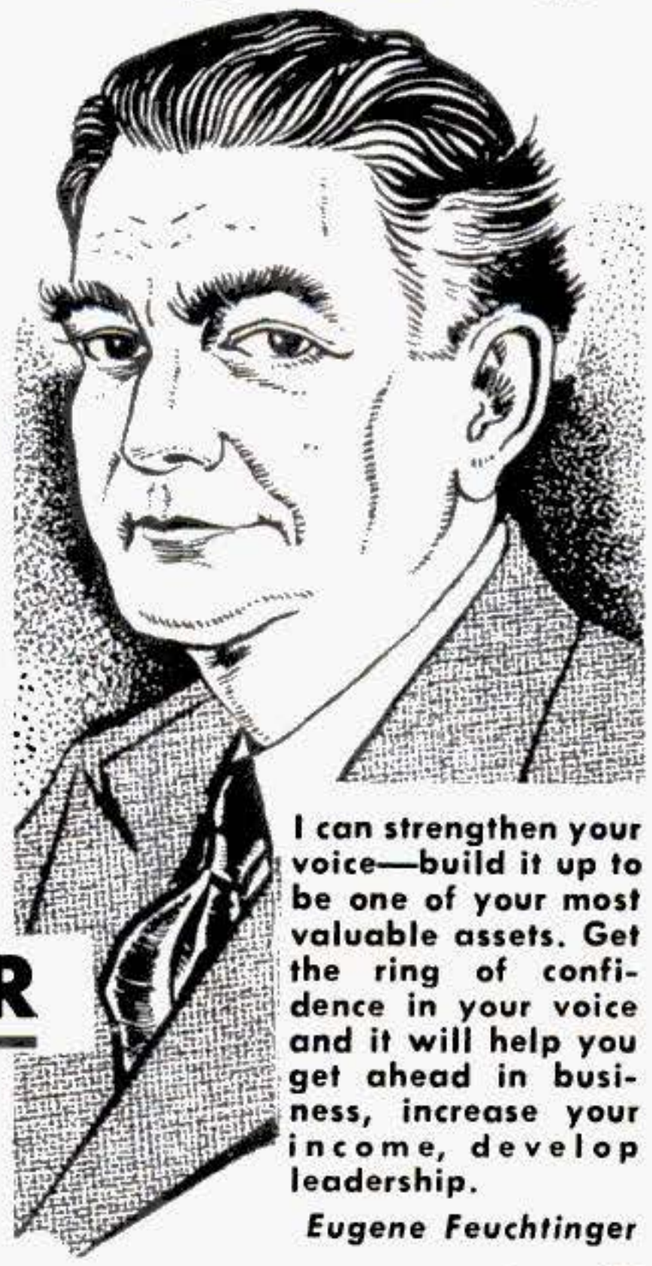
I want to make BIG MONEY taking orders for popular Consolidated Shoes. Please rush your great Sales Outfit, including Special Service Shoes and Demonstrator, with everything else I need to get started RIGHT AWAY!

Name .....
Address .....
Town..... State.....

Copyrighted material

Do you want a SUCCESS-WINNING VOICE?

Give the Feuchtinger Voice-Method a Chance to Help You Develop More POWER VIGOR CHARACTER IN YOUR VOICE



I can strengthen your voice—build it up to be one of your most valuable assets. Get the ring of confidence in your voice and it will help you get ahead in business, increase your income, develop leadership.

Eugene Feuchtinger

Add *controlled* strength to your voice and people will listen when you talk. A stronger voice may make you more interesting, more persuasive, more poised. What you say will have more importance, when your voice is full-toned, because people generally respect a BIG voice.

THOUSANDS ARE HELD BACK BY A NEGATIVE VOICE —*AND DON'T KNOW IT!*

Your popularity and recognition depends, frequently, on your voice and the impression it makes. Don't be handicapped by just an ordinary common weak voice. You'll improve your personality by replacing "thinness" in your voice with new desirable strength. And, of course, I don't have to remind you that a positive voice has dollars-and-cents value to salesmen, executives, union leaders, preachers, politicians, announcers and anyone else who wants to **convince** people.

FREE DETAILS . . . JUST FILL IN COUPON BELOW AND RUSH IT BACK TO ME TODAY

You'll find this training enjoyable as well as valuable—as have more than 150,000 other ambitious students during the past 51 years. Helps both your speaking and your singing. Self-training lessons, mostly silent. You get your results in the privacy of your own room. No music required. Everything is handled confidentially and all mail is sent in plain wrapper. **Take this first step** toward your personal self-advancement now, it's free . . . send for my fascinating illustrated booklet "How to Strengthen Your Voice to be More Successful." Simply fill in and mail this coupon today. (Cannot be sent unless you state your age.)

PREFECT VOICE INSTITUTE, Studio K-1
210 South Clinton St., Chicago 6, Ill.

FREE "Successful Voice" BOOK! MAIL THIS COUPON TODAY

Prefect Voice Institute, Studio K-1
210 South Clinton St., Chicago 6, Ill.

Please send me—free and without obligation—your inspiring and helpful booklet "How to Strengthen Your Voice to be More Successful" by Eugene Feuchtinger. Mail in plain wrapper. No salesman will call.

NAME . . . . . .
ADDRESS . . . . . .
CITY . . . . . STATE . . . . . .
My age is: . . . . . .

WAR SURPLUS BARGAINS

$500,000.00 INVENTORY for QUICK LIQUIDATION

Surplus items—hundreds of them for home, shop, factory, farm and outdoor use. New items, used items, reconditioned items—all at tremendous savings—all priced for quick sale.

PAGE AFTER PAGE OF VALUES

This big catalog shows page after page of amazing money saving values. Write for your copy today. Send 10c to cover postage, mailing, etc. Write today!

10c

SEND TODAY FOR YOUR COPY

STARK'S 509 So. State St. Dept. PS-10. CHICAGO 5, ILL.

SHORTHAND in 6 Weeks at Home

Famous Speedwriting shorthand system. No signs; no symbols; no machines; use ABC's. Easy to learn; easy to write and transcribe. Low cost. 100,000 taught by mail. For business and Civil Service. Also typing. 28th year. Write for free booklet to:

Speedwriting®

Dept. 2610-1, 55 W. 42 St., New York 18

TALK—SING—PLAY OVER YOUR RADIO

with the real Radio Mike! Attaches in a jiffy—**full instructions given! Swell for "parties"—"cut in" on or "kid" regular network programs or** put on **your own broadcasts! Amaze your friends—real fun.** Beautiful Metallic Plastic 6 in. high!

12 RADIO BROADCAST LESSONS GIVEN with each mike

SEND NO MONEY Just pay postman $3.99 COD plus postage or send $3.99 and we pay postage! *Radio Mike* is available *only* from us by mail—*guaranteed.*

Midway Co., Dept. MPS-10, Kearney, Nebr.

Rupture Troubles Ended

Advanced method has healed thousands. No leg straps, no elastic, no plasters. No pressure on hips or spine. Flexo-pad. Entirely different. Endorsed by doctors, mechanics, clerks. Very light. **INEXPENSIVE. GUARANTEED.** Write for information and trial.

SMITH MANUFACTURING COMPANY

EST'D 1893 Dept. PS, Preston, Ont. Can.

OIL FILTER REFILLS . . . 10c

Here's News! Ordinary toilet paper makes an ideal oil filter. Laboratory tests prove it cleans oil faster and better than popular makes of filter elements. All you need is a simple set of **RETLIF ADAPTER PLATES** . . . and you can start using ordinary toilet paper rolls in your present oil filter. For proof and descriptive literature, send name and address to

RETLIF CORPORATION, Dept. 94
1239 No. Highland Ave., Los Angeles 38, Calif.

EARN $25 AND MORE A DAY!

NO SCHOOLING!

STEADY ALL-YEAR WORK!

THOUSANDS ARE SUCCESSFUL!

MAKE BIG MONEY

BE YOUR OWN BOSS!

WANTED—men with ambition and desire to get ahead and *make money* in something for themselves. *Act now*—do as thousands of successful men have done—start on your own in floor surfacing with American Machines!

Take advantage of this opportunity if you want steady year 'round work—earnings of $25 and more a day—pleasant indoor working conditions—and a lifetime of comfortable living for yourself and your family. No schooling—no experience needed. Sanders are easy to operate. Hundreds of prospects—new and old homes. Send coupon for "money-making" booklet entitled "Opportunities in Floor Surfacing"–enclose 25c in coin or stamps to cover handling.

SEND

The American Floor Surfacing Machine Co.
532 So. St. Clair St., Toledo 3, Ohio

Enclosed find 25c in stamps or coin for booklet "Opportunities in Floor Surfacing", telling me how I can start my own floor sanding business.

Name _____

Street _____

City _____ State _____

AMERICAN FLOOR MACHINES

Aeronautical Technology
Pilot and Specialist
Master Mechanic

AVIATION

Best Serves Your Country & Yourself

The aviation industry urgently needs properly trained young men for essential civilian aviation positions. Embry-Riddle offers maximum training in minimum time. Fully accredited 8-mo. to 26-mo. courses in all aeronautical phases also aid rapid military advancement if called to armed forces. Thorough, practical instruction backed by 25 yrs. experience training today's aviation leaders. Complete school campus. Be prepared. Enroll now! Illustrated catalog, address:
REGISTRAR, EMBRY-RIDDLE, DEPT. 91, MIAMI 30, FLA.

Embry Riddle International SCHOOL OF AVIATION

TRAIN IN MIAMI -- AIR CAPITAL OF THE WORLD

LEARN MEAT CUTTING AT NATIONAL

Pay After Graduation

The steady dependable trade of Meat Cutting taught easily in 8 short weeks. You LEARN BY DOING under actual meat market conditions in big modern school at Toledo.

For beginners or men with experience. Get a profitable store of your own. Remember, PEOPLE MUST EAT! Big pay jobs. Free employment help. Thousands of successful graduates.

Buying, cutting, percentage, pricing, advertising, selling, etc. A complete retail meat education. National School established over 25 years. Get National training NOW. Pay your tuition in easy weekly payments after you graduate. G. I. approved. Send coupon for FREE 52 page school catalog—TODAY.

National School of Meat Cutting, Inc.
Dept. 51-X, Toledo 4, Ohio

Send me your FREE school catalog on National Training at Toledo in Meat Cutting, Meat Merchandising and Self Service Meats. No obligation. No salesmen will call.

Name .....

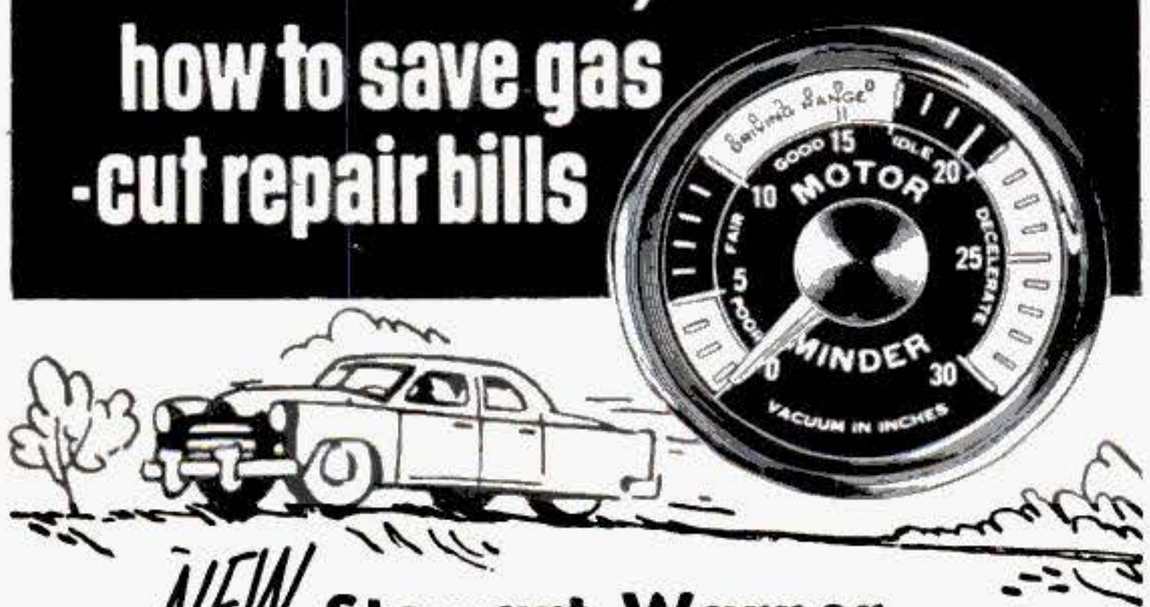
Address .....

City ..... State .....

( ) Check here if Veteran of World War II

Copyrighted material

NOW! see as you drive... how to save gas -cut repair bills



NEW Stewart-Warner MOTOR MINDER

quickly pays for itself in savings

You see at a glance how to keep your motor at gas-saving speed. You're warned at a glance of faulty motor performance—faulty spark plugs, valves, timing, piston rings, manifold, muffler. Same accuracy used by factory trained mechanics. All in plain sight on illuminated dial. Made by Stewart-Warner, the *most* trusted name in precision automotive instruments. Only $10.95.

Ask Your Dealer Now! Or Write

Stewart-Warner

Instrument Division, Dept. P-71
1840 Diversey Parkway • Chicago 14, Ill.

OFFICIALLY SCALED REPLICAS OF THE WORLD'S MOST MODERN AIRCRAFT!

Each Model Approximately 13" Long!

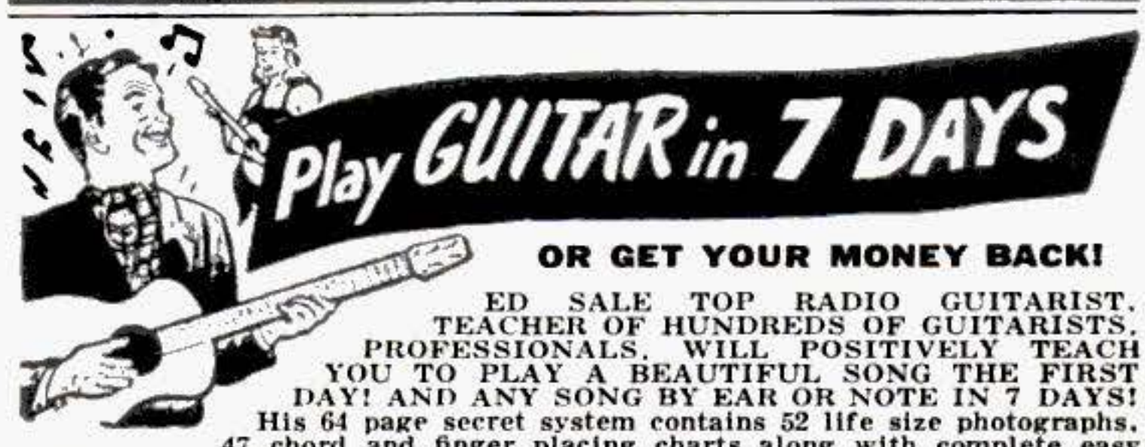
North American F-86 "Sabre-Jet"

THESE ARE EXACT SOLID SCALE REPLICAS of the most modern combat ships now making history in Korea. Both the Russian MIG-15 and the American F-86 jets are real hobbyist collector items! Each kit includes: Completely finished Klean Karved Fuselage, Redi-Cut wings and tail, pilot, rubber wheels—EVERYTHING that's necessary to make a really proud combat plane! **SEND NO MONEY! Remit with order, we pay postage. C.O.D. plus postage.**

Other Beautiful Solids include:
F-51 "Mustang" **F-80 "Shooting Star"**
F-9-F "Panther" **F-84 "Thunderjet"**

only **$2.75** each

Enterprise Model Aircraft & Supply Co., Inc.
5107 Avenue D Dept. S-10 Brooklyn 3, N. Y.



OR GET YOUR MONEY BACK!

ED SALE TOP RADIO GUITARIST, TEACHER OF HUNDREDS OF GUITARISTS, PROFESSIONALS, WILL POSITIVELY TEACH YOU TO PLAY A BEAUTIFUL SONG THE FIRST DAY! AND ANY SONG BY EAR OR NOTE IN 7 DAYS! His 64 page secret system contains 52 life size photographs, 47 chord and finger placing charts along with complete easy to learn instructions on—How to tune, build chords, keep time, base runs, dance chords, swing, over 100 learn-quick examples, etc. plus 110 Popular and Western songs with 1st, 2nd, 3rd guitar, words and music. ABSOLUTELY NO previous music knowledge needed! SEND NO MONEY! Pay Postman $2.50, plus C.O.D. postage (or send cash, I pay postage).

ED SALE Dept. PS-10 POINT PLEASANT, NEW JERSEY

CARBURETOR TOO RICH MAKES MOTORIST TOO POOR

Car owners who are wasting money and not getting proper gas mileage due to over-rich mixtures will be pleased to learn how to save gasoline by VACU-MATING over-rich mixtures. VACU-MATIC fits all cars, trucks and tractors. It is *automatic* and operates on the supercharge principle. Easily installed in a few minutes.

SALESMEN WANTED! Big Profits!
Send name, address on penny postcard for *free particulars* and how to get yours for introducing.

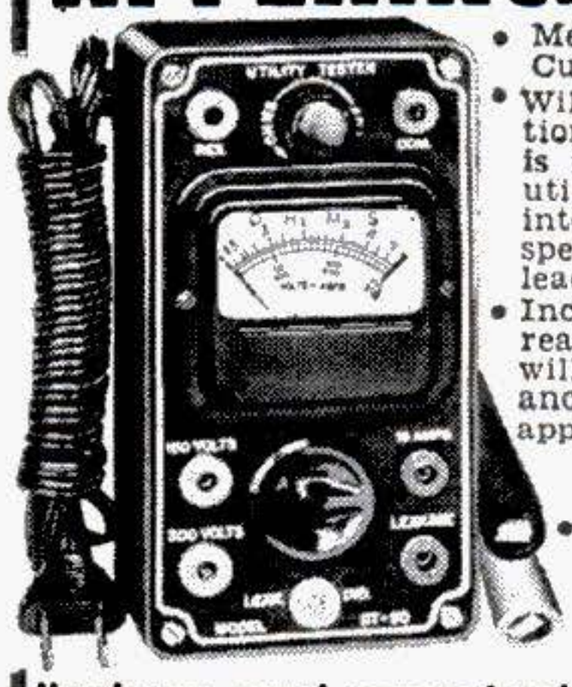
VACU-MATIC Co., 7617-1798 W. State St., WAUWATOSA, WIS.

FREE

HOW TO REPAIR ELECTRICAL APPLIANCES 64 PAGES

***with order for a New Model 50* UTILITY TESTER**

FOR REPAIRING ALL ELECTRICAL APPLIANCES-MOTORS



- Measures **A.C. and D.C. Voltages, Current, Resistance, etc.**
- Will measure the current consumption **while the appliance under test is in operation.** The appliance or utility may be plugged directly into the front panel receptacle. A special pair of insulated clip-end leads is included for motors, etc.
- Incorporates a sensitive direct-reading resistance range which will accurately measure all resistances commonly used in electrical appliances, motors, etc. Continuity checks and tests for shorts and opens.
- Will test thermostats, radio tube filaments, bulbs, fuses, fluorescents, condensers, switches, field coils, circuit breakers, lighting systems, etc.

Handsome round cornered molded bakelite case 3⅛" x 5⅞" x 2¼". Complete with all test leads and instructions. 13.90

SOLD ON EASY PAYMENTS AT THE NET CASH PRICE

No interest or carrying charges added. Remit $3.90 with order, pay balance, $2.00 per month for 5 months.

SUPERIOR ELECTRONIC CO., INC.
Dept. B-34 • 227 FULTON STREET • NEW YORK 7, N. Y.

SHOE REPAIR OFFERS BIG INCOME

LEARN IN 12 WEEKS TIME

You can learn to be a skilled shoe repairman by actually working on shoes and modern machines. The only practical school in U.S. Est. 1927. Big 24-Page Book explains everything. Write Dept. PS for your copy today.

MODERN SHOE REBUILDING SCHOOL
806 So. Figueroa St., Los Angeles 17, Calif.

Sensational Device Tests Eyes

SAVE up to $15.00 on Glasses!
Big news to the millions of Spectacle Wearers and Prospects. Means Freedom from Outrageous Prices. Sold on Money-back Guarantee.

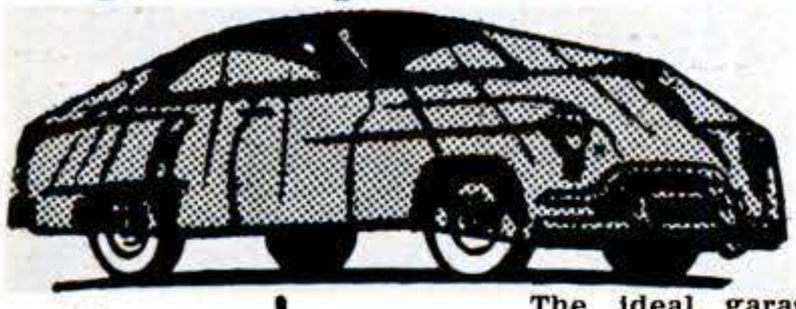
MAKE BIG MONEY QUICK with SAMPLE KIT!
Show it to friends and others. Let them use it Free and watch their amazement over this Self Testing system. Here is a great new opportunity in a tremendous new field of unlimited possibilities. Spare or full time. No experience needed. Write for complete sample kit.

C.G. Optical Co., Dept. A-103, 20 E. Delaware Pl., Chicago 11, Ill.

THORESEN'S HEAVY DUTY VIRGIN VINYL

PORTABLE GARAGE

Try 10 Days at OUR risk!



DELIVERED $10

Goes wherever your car goes

The ideal garage—it travels with your car—resists the ravages of snow, sleet, rain, sun, salt air, etc. Whisks on and off quick and easy. Folds away like a handkerchief. Takes little storage space. SURE-GRIP elasticized bottom offers complete security winter or summer. Pays for itself many times over. Do not confuse with inferior vinyls. Thoresen's resists cracking or peeling, withstands long wear.

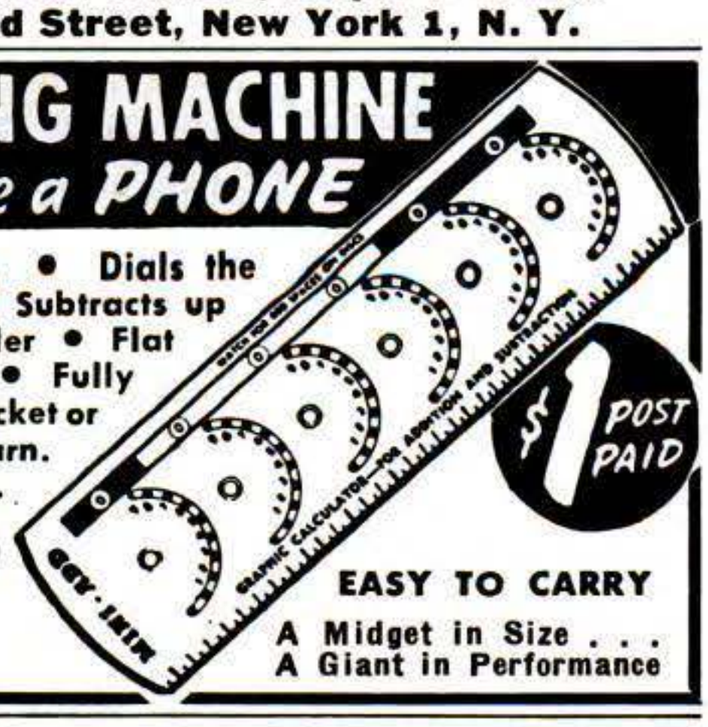
Compare with others selling for $14.95

Trust Thoresen's to give you honest-to-goodness value. This low price made possible by SELLING DIRECT-TO-USERS! Send only $10.00 for quick FREE delivery to your door. Or order C.O.D. plus postage. TRY 10 DAYS AT OUR RISK. Absolutely guaranteed! Your $10.00 quickly refunded if not thoroly satisfied!

THORESEN DIRECT SALES, Dept. 7-L-140
131 West 33rd Street, New York 1, N. Y.

NEWLY INVENTED **ADDING MACHINE**

DIALS like a PHONE



• Fast • Accurate • Dials the Answer • Adds and Subtracts up to a Million • A Ruler • Flat • No Moving Parts • Fully Guaranteed • Fits in Pocket or Purse • Nothing to Learn. Start Using Right Away.

$1 POST PAID

MINI-ADD
DEPT. PS-10
108 5th Avenue
New York 11, N.,Y.

EASY TO CARRY
A Midget in Size . . .
A Giant in Performance

YOUR DREAM HOME—

HOW TO BUILD IT FOR LESS THAN $3500

SAVE up to $8,000 with help of this practical how-to-do-it book! Prepared by "Handyman" Hubbard Cobb and other experts. Plans and instructions for **eight** modern homes! Book also shows how to make every type of improvement—Foundations, Frame and Sheathe, Roof, Set in Windows, Doors, Inside Partitions; install Plumbing, Heating, Wiring; **and more!** 576 big 6¼" x 9¼" pages, 650 illustrations, 2 colors throughout! **750,000 copies sold!** Only $3.95. Mail postal card for 7 days FREE Trial **today!**

Wm. H. Wise & Co., Inc., 50 W. 47th St., N. Y. 19, N. Y.

Buy U. S. Savings Bonds

Natural Jargoon . . . Rivals Diamond in Brilliance and Fire

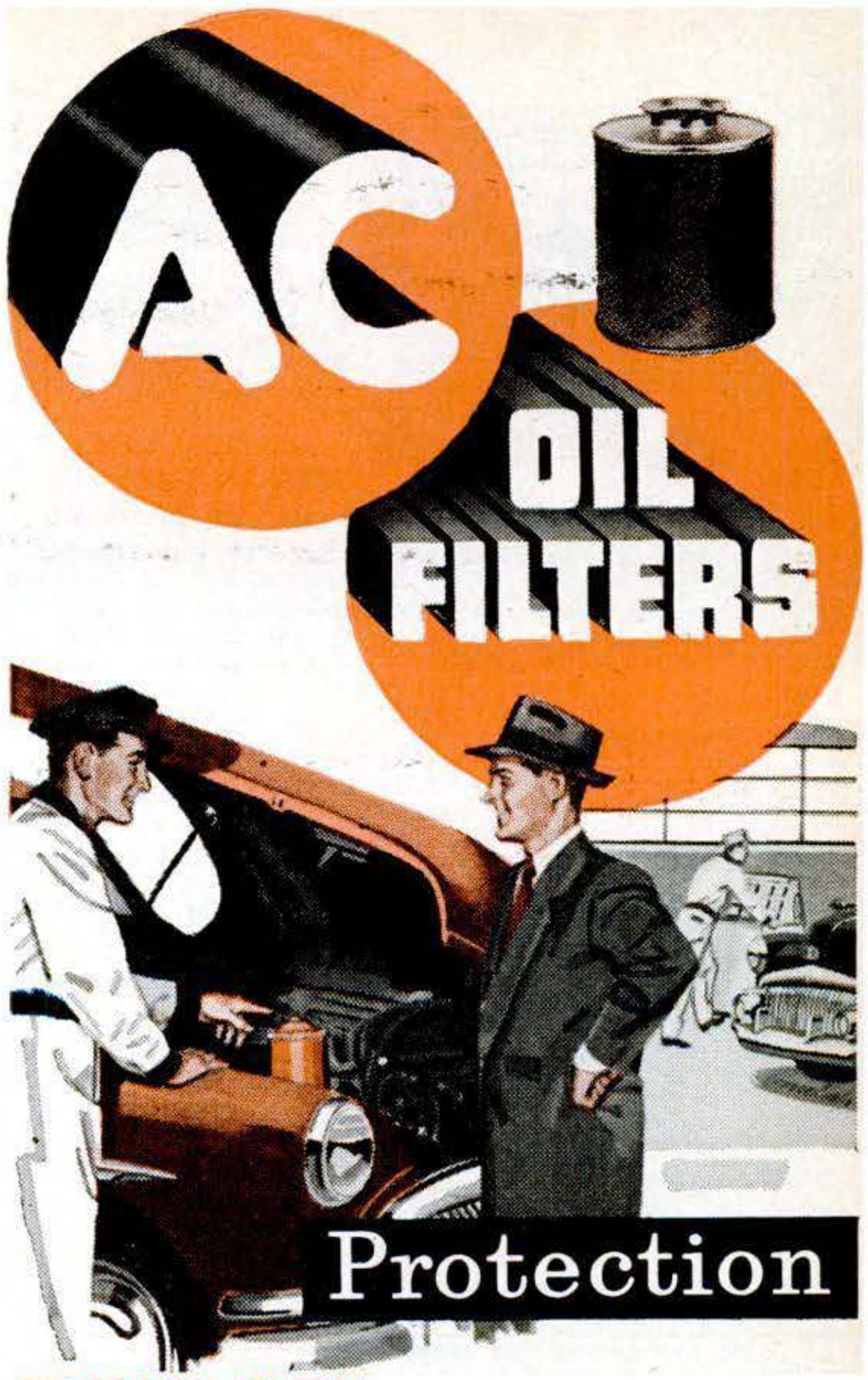
Not a Synthetic Stone!

FREE CATALOG

Nature IS always right . . . and the Jargoon . . . a *natural*, mined gemstone proves it. So white, so fiery that Nat. Geographic calls it the closest rival to the diamond . . . the Jargoon, long a favorite of Sultans, is even included in the British Crown Jewels.

Now you can own a full carat of this *natural* gem . . . mastercraft cut to full 58 facet magnificence for as little as $11.95 plus tax. Free catalog gives full details, facts about Jargoons and synthetic gems. Get your free catalog today!

ORIENT GEM COMPANY
DEPT. PS-14 154 NASSAU STREET NEW YORK, N. Y.



BUICK *"Fireball" Engines are Factory-Equipped with AC Aluvac Oil Filters*

Buick "Fireball" engines are world-famous for their ruggedness, dependability and long life. AC *Aluvac* Oil Filters are standard, factory-installed equipment on all Buick models.

AC *Aluvac* Oil Filters are today's finest means of engine oil filtration. The specially processed *Aluvac* Element has 10 times the filtering area of ordinary elements. *Aluvac* material is so finely meshed it stops particles 1/100 the diameter of a human hair.

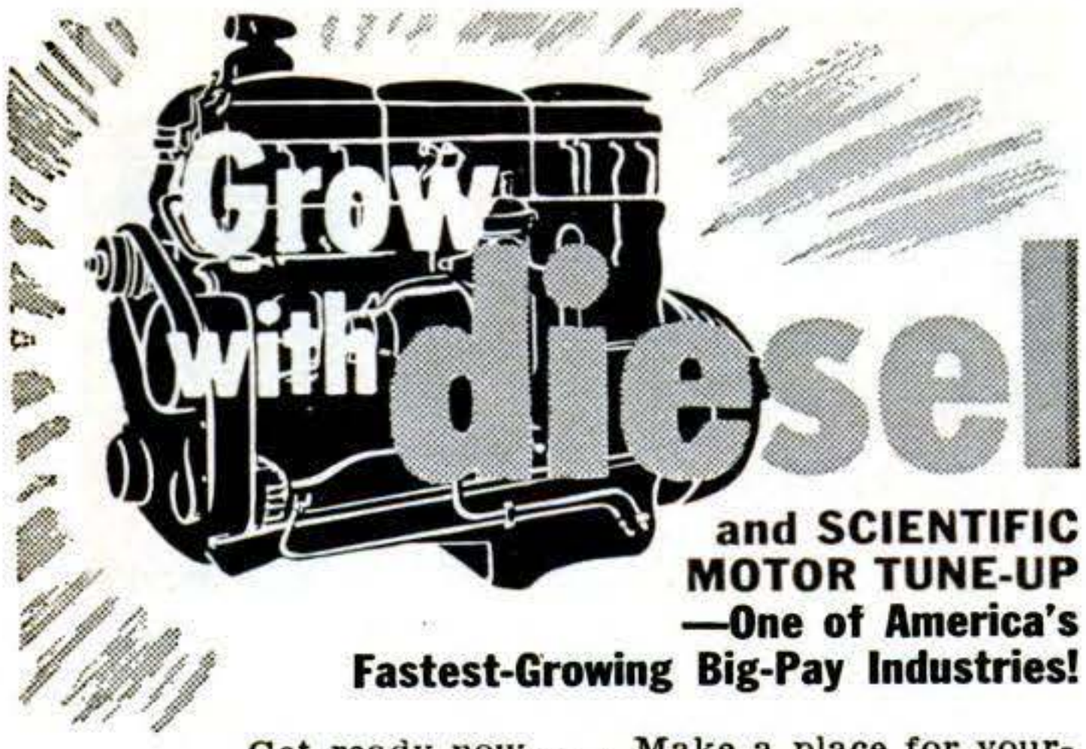
Aluvac keeps dirt and sludge from clogging rings and valves, damaging bearings and moving parts—as never before. It gives Buick owners added engine dependability and even longer engine life.

You, too, can have AC *Aluvac protection*, for AC makes *Aluvac* Elements for most all filters. Have your service man install one in your car.

AC SPARK PLUG DIVISION GM GENERAL MOTORS GENERAL MOTORS CORPORATION

IF YOUR CAR does not have an oil filter you can get a complete AC unit with Aluvac Element at moderate cost. Ask about it next time you change oil.

Copyrighted material



and SCIENTIFIC MOTOR TUNE-UP —One of America's Fastest-Growing Big-Pay Industries!

Get ready now . . . Make a place for yourself in the mighty Diesel industry. Be there to take advantage of the opportunities ahead. The U.E.I. Plan for learning Diesel is simple, practical and is based upon the principle of learning-to-do-by-doing. Includes Auto Engine Tune-Up. You get fundamentals through spare-time home-study, followed by actual shop practice on modern Diesel engines. Experienced instructors guide you step-by-step—you learn the HOW and WHY of Diesel operation, service and maintenance. Get all the facts—mail the coupon and we'll send you a free copy of "Earning Power in Diesel." Mail coupon today!

UTILITIES ENGINEERING INSTITUTE
Dept.DM-11 *(Founded 1927)* Chicago 14, Ill.

UTILITIES ENGINEERING INSTITUTE, DEPT. DM-11.
2521 Sheffield Ave., Chicago 14, Illinois

Please send me, without obligation, your FREE book, "Earning Power in Diesel."

NAME (print) . . . . . AGE . . . . . .

ADDRESS . . . . . .

CITY . . . . . Zone . . . . State . . . . . .

☐ Check here for information if you are under 17

TV SERVICING AT HOME—THIS EASY WAY

SHOOT *TV* TROUBLE *FAST*

With H. G. CISIN'S RAPID "TV TROUBLE SHOOTING METHOD"

Without experience or knowledge, this *guaranteed new* method of servicing TV sets enables you to DIAGNOSE TV troubles as rapidly as an expert. **NO THEORY—NO MATH**—you can locate all faults in record-breaking time, regardless of make or model.

"TV TROUBLE SHOOTING METHOD" is the most valuable aid to TV servicing ever written. It shows you how to repair your own and your friends' sets. Be a TV Trouble Diagnostician. Increase your present earnings. Open your own Profitable Business or get a high-paying skilled job.

It's all in this book . . .
Nothing more to Pay—Nothing else to Buy

HERE'S HOW CISIN'S TV TROUBLE SHOOTING METHOD WORKS:

$1 POSTPAID

You inspect the PICTURE—over 85 picture troubles listed alphabetically—from picture "ABSENT" to "WEAK."

You inspect the bright spaced rectangle—RASTER (picture tuned out). Over 58 raster troubles listed alphabetically.

You listen to the SOUND—17 sound troubles from sound "ABSENT" to "WEAK," all listed alphabetically.

Each listing has a CODE number or letter and when these 3 are put together they tell you **EXACTLY WHERE** the trouble is. Then, step-by-step instructions, including 69 RAPID CHECKS, enable you to find the faulty part.

13 IMPORTANT PRELIMINARY CHECKS NEED NO INSTRUMENTS! Of the 69 Rapid Checks, OVER 65 ALSO REQUIRE NO INSTRUMENTS! Rapid checks include emergency checks for distorted pictures, defective tubes including PIX tube, plus 57 others. ALL EXPLAINED IN SIMPLE LANGUAGE.

PERFORMED WITHOUT INSTRUMENTS, MANY CHECKS USE THE PICTURE TUBE AS A GUIDE.

H. G. Cisin, the author, is the inventor of the AC-DC midget radio. He licenses RCA, AT&T, etc. He has also trained thousands of technicians now owning their own prosperous TV service organizations or holding highly paid TV positions. His years of experience are embodied in this remarkable new **TV TROUBLE SHOOTING METHOD.**

GUARANTEED, MONEY BACK IN 5 DAYS IF NOT SATISFIED.

Send your name and address today! Mail this coupon with only $1.00

RUSH COUPON NOW!

H. G. Cisin, Consulting Engineer
Dept. PS-3 200 Clinton St., Brooklyn 2, N. Y.

Name . . . . . .

Address . . . . . .

City . . . . . Zone . . . . State . . . . . .

HERE'S PROOF! J. B. Seiler, Chicago, writes: "Rush another copy. Am tickled to death with results. Your book hasn't failed me yet."

G. E. Hirsch, Jamaica, N. Y.: "Congratulations. Your book extremely under-priced. Very ingenious in its logical use of cause and effect, should be in every TV tool kit."

U. S. GOV'T SURPLUS

"BARGAIN BOOK"

JUST OFF THE PRESS!

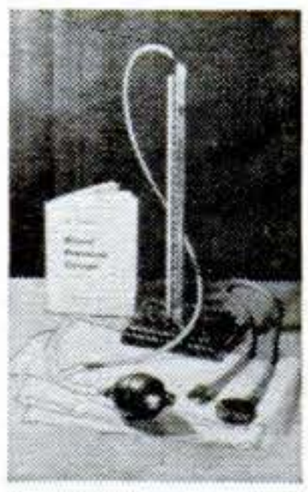
Greatest Bargain Book ever offered low, low prices, terrific savings on scarce war surplus. Mail 10c TODAY - NOW - begin saving on hundreds of items for farm, home, shop, sports. Get your Bargain Book by return mail.

500 BARGAINS
• FARMS • SPORTS • HOME • SHOP

MAIL TODAY Only 10¢

FISLER SALES CO.
723 WALNUT ST., DESK S10, KANSAS CITY, MO.

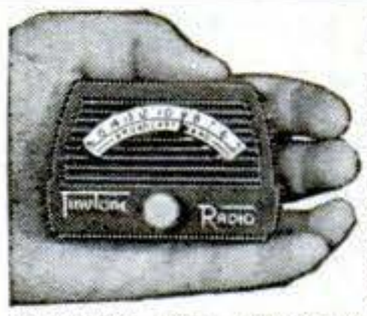
BLOOD PRESSURE GAUGE



$5.98

for HOME USE . . . NOT A TOY. Keep check on yourself! Prevent strokes, kidney damage, etc. Manual has full details on what is prescribed in 95% of All high blood pressure cases. Unit includes a Blood Pressure Gauge, Arm Bandage, Sleeve, 2 Valve Bulb, Base, Stethoscope and 25 Grams of MERCURY. Easy to operate. **Complete outfit sent prepaid for $5.98 or simply send name and address and pay $5.98 plus C.O.D. and postal charges on arrival.**

JOY SPECIALTY COMPANY
Scientific Instrument Department
2320-G W. Hubbard St., Chicago 12, Ill.
"Send for Free Circular"



NEW TINYTONE RADIO

Really Works—World's Smallest Carry in your pocket. **New Preset Crystal** eliminates **All Tubes, Batteries or Electric "Plug-ins" Forever!** Sweep band dial—Beautiful Red Plastic case.

GUARANTEED TO WORK on local stations—use most anywhere—home, cabins, farm, etc. **SEND ONLY $1.00** (bill, ck., m.o.) and pay postman $3.99 C.O.D. postage on arrival or send $4.99 for P.P. delivery. **COMPLETE WITH EXTRA LONG DISTANCE AERIAL KIT AND PHONE. LIMITED SUPPLY—SO ORDER NOW!**

MIDWAY CO. Dept. BPS-10 KEARNEY, NEBRASKA

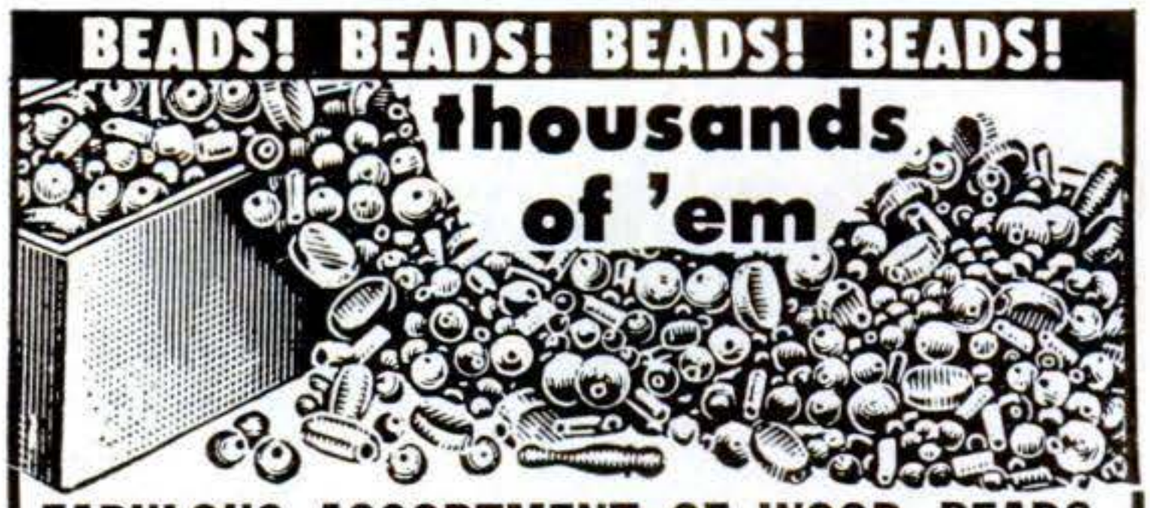
DRIVE 3 TO 6 DAYS A MONTH

Gas Free!

Better Performance, more power, quicker starts, faster acceleration on *all* cars, light trucks, tractors—any age, make or model. Amazing discovery, tested in Engineering Dept. leading U. S. University. Greatly reduces gas consumption—may actually *pay for itself in cash savings.* It can help keep you rolling if gas rationing comes. **Test it 30 days on your own car before deciding.** *Prove for yourself* outstanding benefits of new miracle development by actual day-by-day experience on the road. TRY IT AT OUR RISK. Write or wire today for FREE details, technical explanation and 30 day Examination Request Blank. SEND NO MONEY.

G. B. SCHUYLER, Dept. 310, 2804 10th St., Berkeley, Calif.

BEADS! BEADS! BEADS! BEADS!



FABULOUS ASSORTMENT OF WOOD BEADS

All sizes, all shapes, all colors—Small beads, square beads, oblong beads in all colors—red, yellow, blue, silver, pink, brown, orange, green, etc.!

$2.00 PPD. *for box of several thousand assorted beads*

Send Cash, Check, M. O. Satisfaction Guaranteed

WALCO BEAD COMPANY
37 West 37th Street Dept. PS New York 18, N. Y.
World's Largest Supplier of Beads for Craft Purposes

Copyrighted material

LIFETIME WRITTEN GUARANTEE!

17 JEWEL WRIST WATCH 14.95 Plus 1.50 Tax

WAR ON PRICES!

FORMERLY SOLD FOR $59

INCABLOC SHOCK PROTECTED

WATER & DUST PROOF

Worn by ARMY, NAVY & MARINES
Luminous dial . . . sweep second hand . . . Super Accurate. Imported Swiss precision movement and case. You get these brand new **LIFETIME GUARANTEED** watches now for a small fraction of the original price. You save $44, because we bought-out surplus stock! Don't delay.

10 DAY FREE TRIAL!

WEAR AT OUR RISK!

SAVE $44

MONEY BACK IF NOT DELIGHTED. SEND ONLY $1 DOWN PAYMENT with order. Pay balance to postman on arrival plus postage. Send check or M.O. for full amount and we pay postage. Men's Style $14.95 plus $1.50 tax, total $16.45. Ladies and nurses style $16.95 plus $1.70 tax, total $18.65. Order now at this low price.

FREE! Handsome Expansion Band with Order

NURSES MODEL $16.95 Plus Tax

MARYLAND DISTRIBUTORS, Dept. 298
501 E. Baltimore Street, Baltimore-2, Maryland

WRITE FOR FREE WATCH AND JEWELRY CATALOG AT ALMOST WHOLESALE PRICES

BOYS-IT'S FREE!

"THE WONDERS OF CHEMISTRY"

This exciting new book shows how to amaze your friends with chemical magic, describes many fascinating home experiments, tells of fun, thrills and big future opportunities for boys who know chemistry Special atomic energy feature. Send today!

THE PORTER CHEMICAL COMPANY
51 Prospect Avenue Hagerstown, Maryland

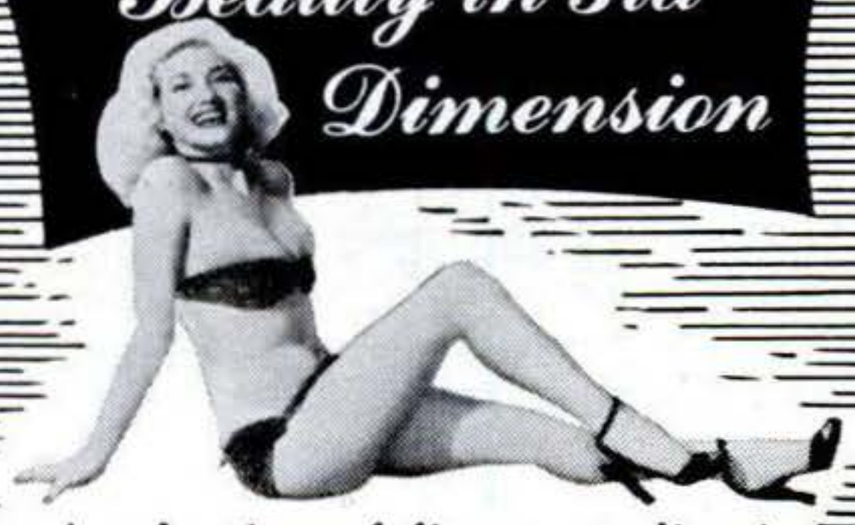
SPORTONE MUFFLERS

Ford & Chevrolet	$ 4.45
All other popular cars	5.45
V-8 Dual Sets	15.95
Chromed Silentips	2.95

(Please state make & year of car on all orders.)

SANDEE MUFFLER CO.
5643 Corryne Place • Culver City, California

Beauty in 3rd Dimension



A selection of figure studies in breathtaking 3rd Dimension. These pictures come to life when viewed through the magic viewer. Realistic depth and beauty only 3rd Dimension can provide.

Send 25c for Magic Viewer & Samples

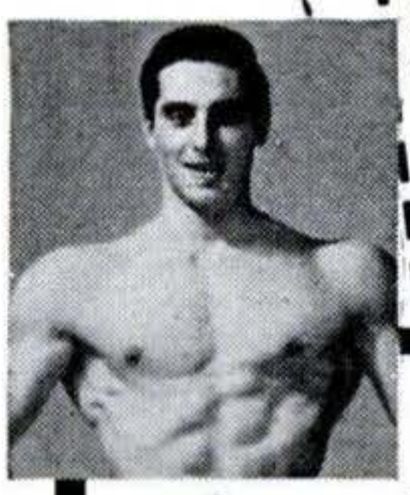
FREE LISTS

LOU TAGER
141 N. La Brea Ave., Los Angeles 36, Calif.

Dept. US-8

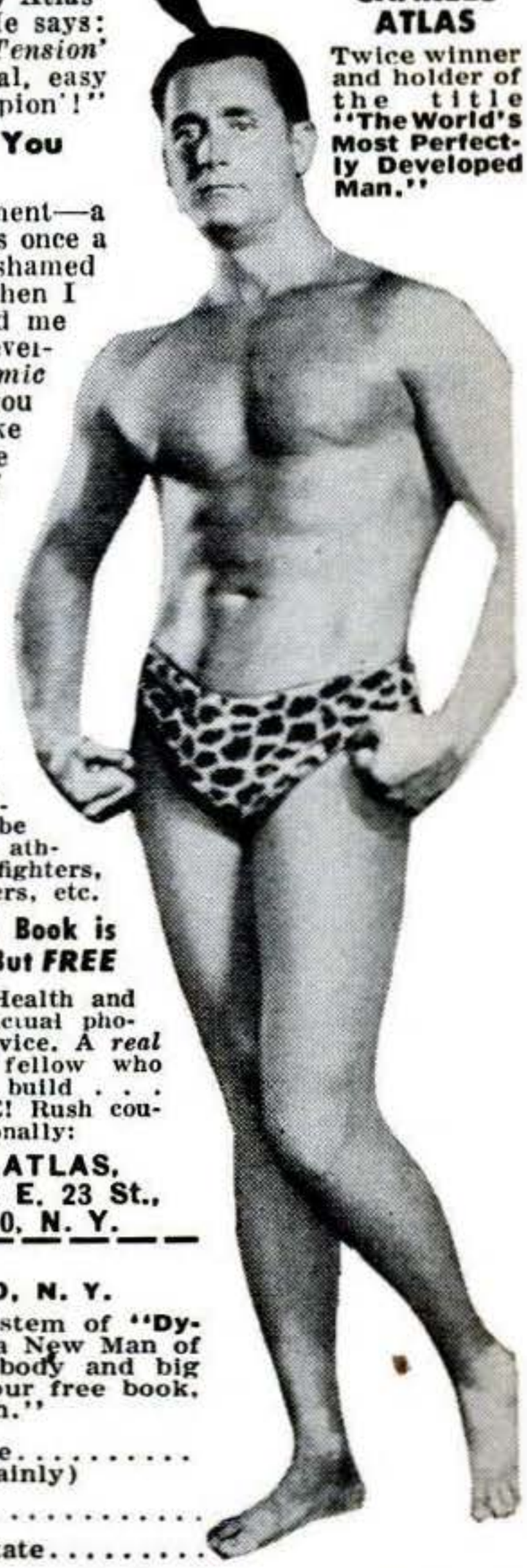
HE Mailed This Coupon

CHARLES ATLAS
115 East 23rd St, New York 10, N. Y.
I want the proof that your system of "*Dynamic Tension*" will help make a New Man of me—gives me a healthy, husky body and big muscle development. Send me your free book, "Everlasting Health and Strength."
Name THOMAS MANFRE (Please print plainly)
Address 215-45 ...
City Bayside State N.Y.



...and Here's the Handsome Prize-Winning Body I Gave Him!

Thomas Manfre of New York mailed my coupon. Got my free book. Won my Atlas-Champion, Sterling Silver Cup. He says: "Look at me NOW! '*Dynamic Tension*' WORKS! I'm proud of the natural, easy way you made me an 'Atlas Champion'!"



CHARLES ATLAS
Twice winner and holder of the title "The World's Most Perfectly Developed Man."

Let Me Prove I Can Make You a New Man!

Would you like greater development—a muscular body? Then listen: I was once a 97 lb. weakling. Afraid to fight, ashamed to be seen in a swimming suit. Then I discovered the secret that changed me into "World's Most Perfectly Developed Man." My secret is "*Dynamic Tension.*" Its purpose is to give you powerful rippling muscles you like to see in your mirror. And for those with systems sluggish from lack of exercise—to help them tone up their entire body, inside and out.

Only 15 Minutes a Day

My method—"*Dynamic Tension*"—will turn the trick for you. No **theory**—every exercise is **practical.** And man, **so easy!** Spend only 15 minutes a day in your own home. From the very start, you'll be using my method of "*Dynamic Tension*" almost unconsciously every minute of the day—walking, bending over, etc.—to BUILD MUSCLE and VITALITY. And *you'll* be using the method which many great athletes use for keeping in condition—prize fighters, wrestlers, baseball and football players, etc.

FREE My 48-Page Illustrated Book is Yours—Not $1 or 10¢—But *FREE*

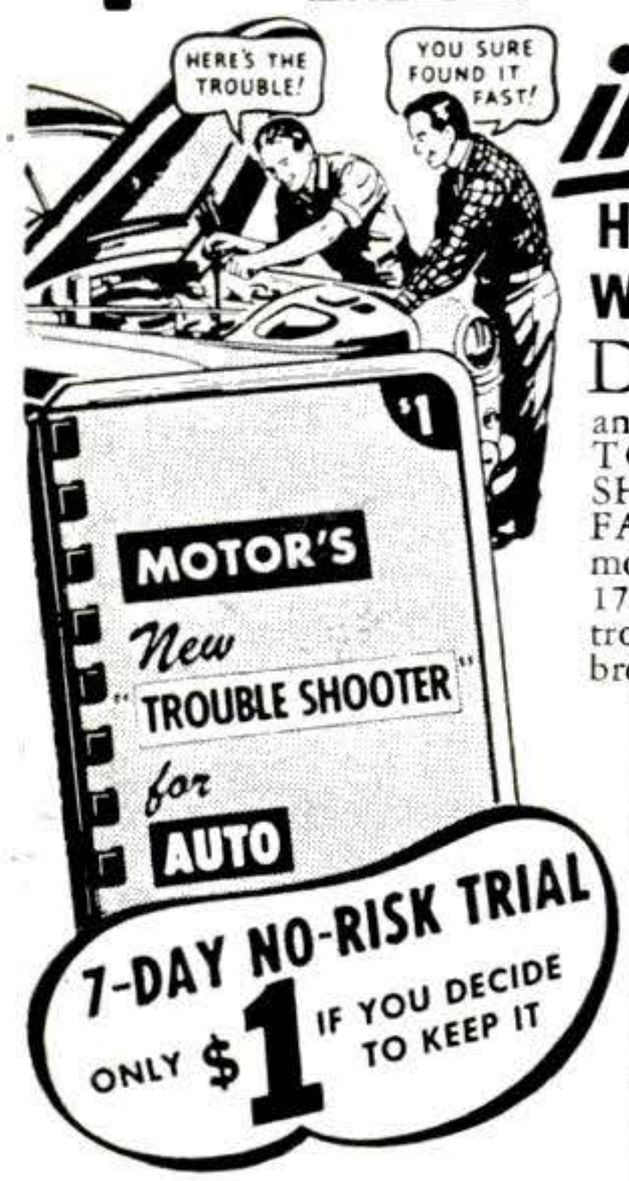
Send for my book, "Everlasting Health and Strength." 48 pages, packed with actual photos, valuable advice. A *real prize* for any fellow who wants a better build . . . but yours FREE! Rush coupon to me personally:

CHARLES ATLAS, Dept. 1K, 115 E. 23 St., New York 10, N. Y.

CHARLES ATLAS, Dept. 1K
115 East 23 Street, New York 10, N. Y.
I want the proof that your system of **"Dynamic Tension"** will help make a New Man of me—give me a healthy, husky body and big muscle development. Send me your free book, "Everlasting Health and Strength."
Name.....Age.....
(Please print or write plainly)
Address.....
City.....State.....

Copyrighted material

Spot ANY Car Trouble *in a jiffy!*



Handy Guide Helps Find What's Wrong Fast!

Don't waste time and work trying to track down car and truck troubles. Let MOTOR's new TROUBLE-SHOOTER help you find them FAST. Prepared by Editors of famous MOTOR's Manuals. Lists 1760 specific causes of auto trouble—knocks, misses, noises, breakdowns, etc. If car has Connecting Rod noise—just turn to Connecting Rod Section for the 8 things that can be wrong. Covers engines, clutches, brakes, ignitions, new automatic transmissions, etc. Fits right in pocket for instant use. Spiral binding lets book stay open while you work. Cross-section PICTURES. Valuable help for beginners, experienced mechanics.

TRY IT AT OUR RISK Deposit $1 with postman, plus C.O.D. chgs. on delivery. Use 7 days, if not delighted, your $1 back. (SAVE C.O.D. Chgs. by sending $1 now.) Write. MOTOR Book Dept., Box AC., 250 W. 55th St., N. Y. 19, N. Y.

Tells how to Spot 87 Automatic Transmission Troubles. 8 Causes of Connecting Rod Noise. 82 Causes for Engine "Misses". 45 Causes of Excessive Oil Consumption. 14 Common Causes of Crankshaft Noise. 73 Checks for Clutch Troubles. 66 Causes of Rear-Axle Trouble. 81 Causes of Brake Trouble. 27 Checks for Faulty Springs and Shock Absorbers. 84 Different Types of Wheel Troubles . . . **LOTS MORE.**

New Amazing Invention—"Magic Art Reproducer"

DRAW THE FIRST DAY!

NO LESSONS! NO TALENTS!

You Can Draw Your Family, Friends, Anything From REAL LIFE—Like An Artist Even if You CAN'T DRAW A Straight Line!

Anyone Can Draw With This Amazing New Invention—instantly!

Also Excellent for Every Other Type of Drawing! **• Human Figures • Outdoor Scenes, landscapes, buildings • Still life, vases, bowls of fruit, lamps, furniture, all objects • Copy photos, other pictures, portraits, etc. • Copy blueprints, designs, decorations, etc., for woodwork, machine, for needlework, crocheting, knitting • Copy all cartoons.**

Complete for only $1.98

Yes, anyone from 5 to 80 can draw or sketch or paint anything now . . . the very first time you use the "Magic Art Reproducer" like a professional artist—no matter how "hopeless" you think you are! Anything you want to draw is automatically seen on any sheet of paper instantly! Then easily and quickly follow the lines of the "picture image" with your pencil . . . and you have an accurate original drawing that anyone would think an artist had done. Also makes drawing larger or smaller as you wish. Anyone can use it on any desk, table, board, etc. —indoors or outdoors! No other lessons or practice or talent needed!

Have fun! Be popular! Everyone will ask you to draw them. You'll be in demand! After a short time, you may find you can draw well without the "Magic Art Reproducer" because you have developed a "knack" and feeling artists have—which may lead to a good paying art career.

FREE! "Simple Secrets of Art Tricks of the Trade"

This valuable illustrated guide is yours FREE with order of "Magic Art Reproducer." Easy ABC art tricks that anyone can follow on different techniques, effects, proportions, perspectives, shading, color, animated cartoons, human figures to use with "Magic Art Reproducer" for added touches to your drawings.

SEND NO MONEY!
Free 10-Day Trial!

Just send name and address. Pay postman on delivery $1.98 plus postage. Or send only $1.98 with order and we pay postage. You must be convinced that you can draw anything like an artist, or return merchandise after 10-day trial and your money will be refunded.

Norton Products Dept. 4410, 296 Broadway New York 7, N. Y.

SEND FOR FREE CATALOG

From New York's Leading **PAWNBROKER GENUINE**

DIAMONDS

Fantastic values! Fine diamonds at a fraction of their original cost, from un-redeemed loans, banks and estates being liquidated. Re-set in smart, brand new, men's and ladies' mountings of 14 kt. Gold and Platinum. 10 DAY UNCONDITIONAL MONEY-BACK GUARANTEE. Established since 1882 Kaskel's have sold over 1,000,000 satisfied customers. Write for FREE CATALOG. Our References: Your own bank or any Mercantile Agency.

MONEY BACK GUARANTEE

SAVE up to 50% and more

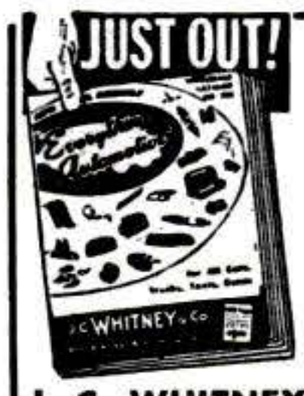
KASKEL'S • Kaskel Bldg., 9 Columbus Ave. New York 23, N. Y. Dept. PS-O

HOW TO IMPORT!

FOR PROFIT AND PLEASURE

Men—women! Learn how to import at low foreign prices for your local buyers. No previous experience needed. Big profits possible, no stock investment. World-wide Import-Export business from your own home by mail order, spare—full time. (Example of money saving prices at left) Big savings on clothes, tools, antiques, watches, china, silk, toys, etc. Get FREE list of imports from Europe—Orient, etc. Trade world-wide from small towns—large cities—or travel abroad. World Trade Home Course sent on five day no risk examination. Write today for FREE details and list. Airmail reaches us overnight. Mellinger Co., Exporters-Importers, 1715-C Westwood Blvd., Los Angeles 24, California.

FREE! LIST OF OVER 1000 LOW PRICED IMPORTS



1952 EDITION

It's New! It's Different! Get world's largest Auto Accessory & Parts Catalog and save money. Over 50,000 items, including Hollywood Accessories, Hi-Speed Equipment, Rebuilt Engines, all parts & accessories for all cars & trucks. We have that Hard-To-Get part! Jam packed with bargains. Completely illustrated. (100 pages) Send 25c (refundable).

J. C. WHITNEY, 1917-F Archer, Chicago 16

WAR SURPLUS BARGAINS

Over 200 terrific ALSO FACTORY SURPLUS **VALUES!**

SEND FOR **FREE** *catalog*

SIOUX FALLS SURPLUS STORE SIOUX FALLS, S.DAK.

"FALSE TEETH BE DAMNED!"

If that's how YOU feel — because plates slip and rock and cause sore gums — try Brimms Plasti-Liner. One application makes plates fit *snugly and stay that way,* because Brimms Plasti-Liner is a permanent reliner. It relines and refits loose plates in a way no powder or paste can do. Even on old rubber plates you get good results six months to a year or longer. **YOU CAN EAT ANYTHING!** Simply lay soft strip of Plasti-Liner on troublesome upper or lower. Bite and it molds perfectly. *Easy to use,* tasteless, odorless, harmless to you and your plates. Removable if desired. Money back if not completely satisfied. *Ask your druggist!*

BRIMMS PLASTI-LINER
THE PERMANENT DENTURE RELINER

Copyrighted material

Get into

DIESEL-AUTO MECHANICS

Master ALL Phases

SHOP-METHOD HOME TRAINING

BY AN ESTABLISHED RESIDENT SCHOOL PREPARES YOU FOR MANY GOOD JOBS

Opportunity is everywhere for the trained Diesel-Auto Mechanic: highways throng with cars, busses, trucks, tractors; garages and Service Stations are busy; factories, ships, farms, railroads, general industry, are dependent upon engine power. Here's a dynamic, fast-growing field that needs trained men who know ALL phases: Installation, operation, maintenance and repair. Now—National Schools offers you a practical, all-embracing Diesel-Auto Mechanic's Course, including:

Complete training in Diesels, High Speed and Heavy Duty; Semi-Diesels, Gasoline and Special Fuel Engines AND Allied Mechanics.

As a National Schools graduate, you are trained for ALL opportunities in the Diesel & Auto Industries.

Jobs Like These Are Available to TRAINED MECHANICS:

Diesel Fuel Injection
Automotive Motor Tune-up
Diesel Engine Rebuilding
General Garage Mechanic
Agricultural Implements
Auto Engine Rebuilding
Auto Elect. Service
Public Utilities • Parts Dealers
Bus and Truck Lines
Industrial Maintenance
Contracting & Excavating
Business of Your Own
AND many other similar openings.

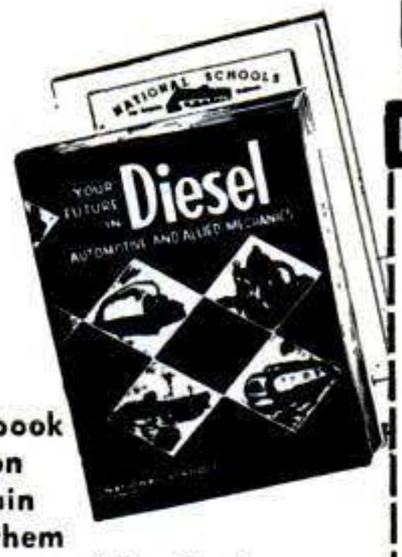
EARN WHILE YOU LEARN

You receive Spare Time Work Lessons, which show you how to earn while you Learn . . . for extra money and experience. You Learn by DOING.

TOOLS & EQUIPMENT

To make your training complete, we give you selected mechanic's tools and equipment, including all-metal toolbox—as a regular part of your instruction.

THESE **2 FREE BOOKS** TELL YOU HOW!



New Illustrated book and sample lesson show how we train you . . . send for them today! No cost . . . no obligation!

NATIONAL SCHOOLS
LOS ANGELES 37, CALIF. • EST. 1905

FIND OUT NOW • MAIL COUPON TODAY

National Schools, Dept. 10-PSD
4000 South Figueroa Street
Los Angeles 37, California

(Mail in envelope or paste on penny postcard)

Mail me FREE the book, MY FUTURE IN AUTOMOTIVE-DIESEL MECHANICS, together with the Sample Lesson. I understand no salesman will call on me.

NAME_____ AGE_____
ADDRESS_____
CITY_____ ZONE____ STATE_____

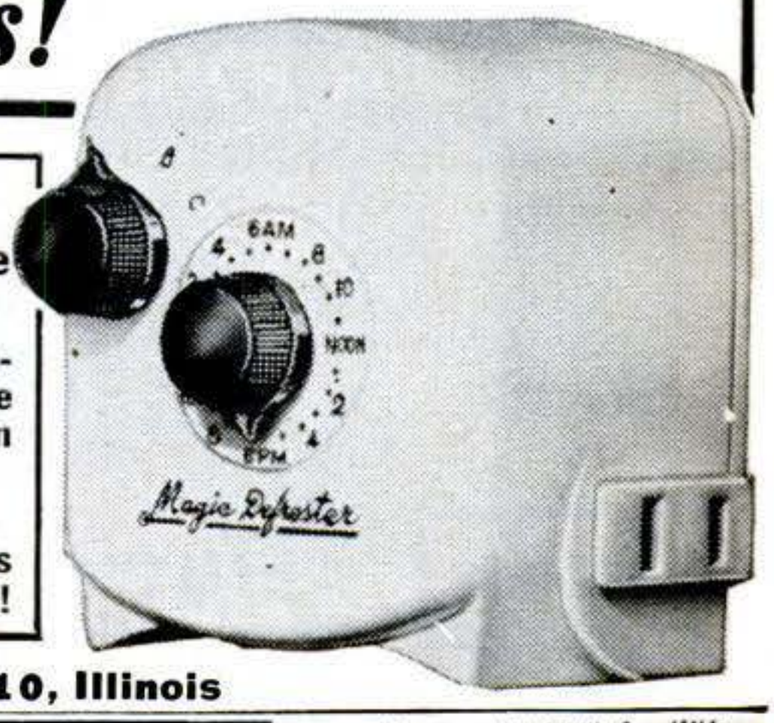
Amazing Attachment MAKES OLD REFRIGERATORS INTO MODERN *Automatic Defrosters!*

Thirty Million Prospects. Sell without "selling pressure" on sensational Free Trial Plan. Just plug it in and leave it. Frees women from drudgery and mess of defrosting. Saves electricity. Keeps food longer, better. Gives longer life to refrigerator. Secret "follow-up" Plan often brings five additional sales by making every user your agent. Big season now on!

SENT FREE . . . *JUST SEND NAME!*

Don't send a cent—just your name on penny postcard. We'll send you the biggest money-maker you ever got your hands on and guarantee your sales at profits as high as $5.00 on each sale. Rush your name!

Women buying by the thousands!
Salesmen Cleaning up on "Free Trial" Sales Plan
Sent Free with Instructions.
Make as high as $5 on Every Sale!

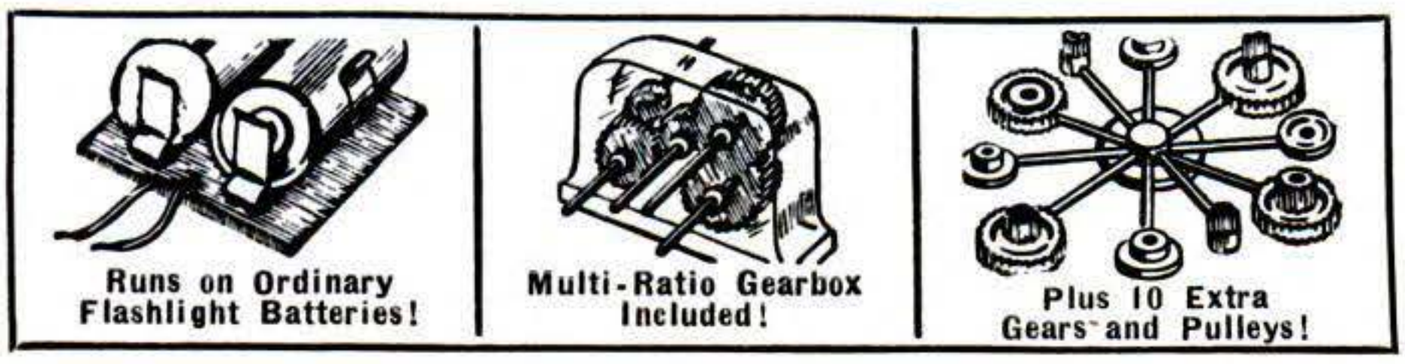


MAXILUME COMPANY, 125 West Hubbard Street, Dept. D-910, Chicago 10, Illinois

POWERFUL MIDGET MOTOR

DRIVES MODEL PLANES, BOATS, CONSTRUCTION SETS, Etc. WITH AMAZING SPEED! RUNS ON FLASHLIGHT BATTERIES!

BOYS! MODEL-MAKERS! Get this new MIGHTY MIDGET D. C. Electric Motor. It's a honey! Looks and runs just like a big one. Motor is powerful yet measures only 1 x 1 x 1¼ inches; weighs one ounce! Turns up to 6,800 r.p.m.'s. REVERSES instantly. Motor is in durable black plastic housing. Comes complete with two 1½ volt batteries in clip holder, transparent plastic gearbox—PLUS ten extra gears and pulleys for working out your own ratios. No shocks, sparks or shorts. And no transformer is needed. Endless hours of fun. Educational, too! Money back guarantee!



ONLY $2.98

Send no money. Order today. Pay postman only $2.98 plus postage when delivered. Or send $2.98 with order and we will pay postage. Supply is limited. Write NOW!

IMPERIAL SALES CO., Dept. A-006
114 East 47 Street New York 17, N. Y.

Copyrighted material

MORE BRILLIANT THAN DIAMONDS

Kimberlite Gems

the world's newest precious stone

SEND FOR FREE ILLUSTRATED BOOKLET

A miracle of modern science as described in recent issues of Saturday Evening Post and Readers Digest. A magnificent new precious gem whose fire and brilliance cannot be approached by any other gem on earth. Dazzling Kimberlite rivals the diamond in beauty but stones of equal size are 1/30th the cost ($24 a carat unset—tax incl.). Send today for free illustrated booklet telling this thrilling story and describing pins, earrings and ladies' and men's rings. Write Dept. P.S.-10.

KIMBERLITE GEM CO., RED BANK, N. J.

HERE'S A REAL MONEY MAKER FOR YOUR HOME WORKSHOP

- WELDS
- CUTS
- SOLDERS
- BRAZES
- CHARGES
- BATTERIES

ORDER YOUR WELDER NOW

Fill out and mail to THE LINCOLN ELECTRIC COMPANY Dept. 205 Cleveland 1, Ohio

"LINCWELDER 60"

New Lincoln Arc Welder

Cash in on these Profitable Jobs!

Be the handyman welder for your neighborhood. Repair damaged car bodies and fenders. . . . fix toys and garden tools . . . braze and solder broken parts . . . recharge batteries.

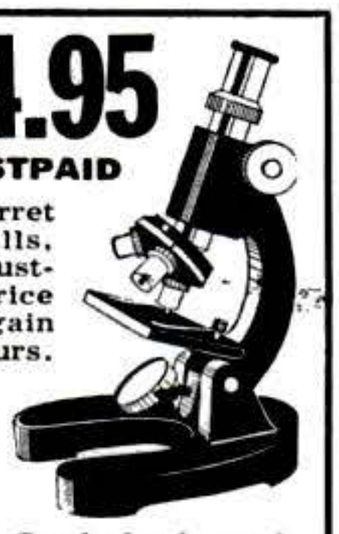
- **Simple to install . . . operates from 115 volt grounded circuit. (No. 12 wire fused for 20 amps.)**
- **Approved by Underwriters Laboratories.**
- **Comes complete with full instructions.**

☐ Ship me the "Lincwelder 60" with accessories $48.00 (Including headshield, electrodes, carbons, electrode holder, ground clamp and cable). ☐ Arc Torch $6.25 extra.
☐ Battery Charging Attachment $10.00 extra.
Enclosed is ☐ check ☐ money order
☐ Send me free bulletin on the new "Lincwelder 60"

Name_____
Address_____
City_____ State_____ 205

300 Power Import

MICROSCOPE $14.95 POSTPAID



LABORATORY MODEL—Triple revolving turret holds 100, 200, and 300 power lenses! No frills, just excellent optical qualities, delicate adjustment, solid construction. Its quality and price astounded biology instructors. A lifetime bargain for students, schools, labs, research, amateurs. *Anyone can now own one!* (Performance cannot be duplicated for $75.00)

FEATURES: Fine micro adjustment, adjustable plano substage mirror. Dovetail hardwood case included free. If you are not amazed at its quality, send it back in 10 days. Your money refunded immediately. Send check, cash or M.O. for **$14.95** ppd.

SWISS PATTERN FILES

Set Of Twelve—Swiss pattern files, Sheffield steel. For fine work. Regularly $8.95. All different. Special. $3.95 per set postpaid.

Free catalog. Money back guarantee.

AKRON ARMY-NAVY STORES 4400 Sunset Blvd. Los Angeles 27, Calif. Dept. 10-S

LEARN TO DANCE $1.00

Why be a lonely, unpopular wall-flower? Learn all the smart dances from the most modern to the old favorites—at home, in private without teacher, music or partner. So simple even a child can learn quickly. Tap dancing, Waltz, Collegiate, Samba, Rhumba, Jitterbug and many others, including illustrations. Complete course only $1.00. Also, delightful old square dances with illustrations for $1.00. Get each Separate or both for $1.98. If you order both take your choice of FREE-DREAM BOOK or LOVE-LETTERS. C.O.D. orders 25c extra and Postage.

Superior professional taps, both toes and heels $2.98 prepaid or C.O.D. plus shipping charges. State size, large or small.

ROLLDEX, P. O. Box 45, Dept. D-85, Huntington Sta., N. Y.

WHAM-O SPORTSMAN* $1.25 POSTPAID

45-LB. PULL!

HITS LIKE A .22 RIFLE—
KILLS RABBITS, SQUIRRELS.
Powerful, silent, accurate.
For hunting, target, routing pests.
Sportsman's choice sold world over!

HUNTING SLINGSHOT

Heavy duty 7" ash stock.
40 steel balls, extra rubber, target.
GUARANTEED - at dealers, or send $1.25 to Wham-O Mfg. Co., Box 8B, South Pasadena, Calif.
* **Professional model of Nat'l Slingshot Assn.**
Extra steel ball ammunition, **75c for 200**

WAXES FLOORS WITHOUT "WAX"

Waxes Floors Without "Wax"

No more floor wax to buy. No messy pastes, liquids. *The wax is right in the pad.* Easy to use. No tiresome kneeling. Simply glide over your floors, linoleum, etc. *Take orders from friends! Make money!*

SAMPLES FOR TRIAL

Sample offer sent immediately to all who send name at once. Hurry—postcard will do. SEND NO MONEY—*just your name.*
KRISTEE PRODUCTS CO., Dept. 708, Akron 8, Ohio

If Ruptured

CAN YOU HOLD BACK YOUR RUPTURE LIKE THIS?

If You Can, then do what others now do — wear a neat light weight and inconspicuous appliance which provides Freedom and Comfort in every normal day and night activity while wearing it.

Entirely Different

Will mail circular in plain envelope.

Write me Today For **FREE** Descriptive Circular

FRED B. MILLER
MANUFACTURER
DEPT. P, HAGERSTOWN, MARYLAND

Copyrighted material

NEW! NOW YOU CAN EARN $5 PER HOUR

PRINTING

WITHOUT A PRINTING PRESS OR ANY SPECIAL EQUIPMENT

CLIP AND MAIL FOR FREE SAMPLE—*Send No Money*

SCREEN-PRINT CO., DEPT. 110
1010 SOUTH LOS ANGELES ST., LOS ANGELES 15, CALIFORNIA
Dear Mr. Nowak; Please rush FREE sample and all information necessary.

Name _____

Address _____

City _____ State _____

GET MY FASCINATING NEW FREE PROFIT PLAN NOW— yours for the asking OFFER LIMITED— MAIL COUPON TODAY!

C. J. NOWAK
General Manager

ABSOLUTELY FREE

SEND NO MONEY! PAY POSTMAN NOTHING!

START IN YOUR SPARE TIME IN YOUR HOME

Print paper of all kinds (even greeting cards)

PRINT BANNERS

PRINT FABRICS

One of America's FASTEST GROWING BUSINESSES – Thousands already are making BIG MONEY using the MIRACLE new SCREEN-PRINT method. Yes, they're printing signs, posters, banners, drapes, wall paper, show cards, flags, fabrics, etc. WITHOUT A PRINTING PRESS OR ANY SPECIAL EQUIPMENT. Now!–the secret can be yours to read, learn, and decide your future . . . just mail coupon now.

GET INTO BUSINESS FOR YOURSELF–Be your own boss–make your home your office in this profitable business. Make EXTRA money in your SPARE TIME or start your own FULL TIME business. IT'S EASY. Get orders from stores, markets, gas stations, theaters –from every kind of business – A HUGE ready-made DEMAND.

Easy to learn—no experience necessary. ANYONE – (young or old) can profit handsomely with the sensational Screen-Print method.

EARN $50 EXTRA PER WEEK—TO START. It's easier than you think–materials cost you only 10%–*YOU EARN 90%*. Few businesses make this big profit.

SCREEN-PRINT IN DEFENSE! –Instrument faces, insignias, flags, etc.—hundreds of defense products are produced by SCREEN-PRINTING—materials are NEVER SCARCE! SCREEN-PRINT offers you a way to make Big EXTRA MONEY if your wages are Frozen too.

Written in EASY-TO-UNDERSTAND SHOP TALK . . . complete with MANY ILLUSTRATIONS. Yes, that is my AMAZING OFFER . . . Read it all WITHOUT RISKING A PENNY. This OFFER IS LIMITED – mail coupon TODAY!

JUST MAIL COUPON —Examine ACTUAL SAMPLE and facts about this AMAZING BOOK that tells you *HOW*

- to do Screen Printing
- to set up Screen-Print Shop of your own
- to get customers COMING TO YOU
- to start spare time and GROW
- to have TWO INCOMES instead of one
- TO CHARGE (on some jobs you make $10 or more per hour)
- to EMPLOY OTHERS to help you

...EVERYTHING YOU NEED TO START!

PRINT INSTRUMENTS

PRINT POSTERS

PRINT SIGNS

PRINT TIES

YOU CAN PRINT ANYTHING AND EVERYTHING WITH THE NEW SCREEN-PRINT METHOD

SCREEN PRINT TRADE MARK REG.

1010 SO. LOS ANGELES ST., LOS ANGELES 15, CALIF.

"MYSTERY SIGNS"

Stick To Any Polished Surface Without Tape or Glue

Washable! Re-usable! Indestructible!

FREE SAMPLES

I will show you how to make $200 or more per week . . . with just 13 words! Write at once for FREE sample of amazing new signs and letters that every store-owner needs and wants. Stick one on his window . . . customers walk in . . . you collect cash on the spot! Yes, it's that simple! Amazing new scientific "miracle material" makes sales easy, profits pour in. Only a limited number of kits on hand, so act fast. Write to me, Jim Frank, at once.

CLAYTER CORPORATION, 65 West 39th St., N.Y.C., Dept. PS-10

DRAW for MONEY . . . Be an ARTIST !

Trained Artists are Capable of Earning $65, $80, $100 & MORE a WEEK!

YOU CAN learn to draw at home in your spare time the well-known WSA way. COMMERCIAL ART, DESIGNING, CARTOONING all in ONE complete course. No previous Art experience necessary—we teach you step-by-step. Prepare for a fascinating hobby or profitable career. Good art jobs await artists in advertising, television, publishing, etc. For 37 years WSA graduates have been making good—WHY NOT YOU? **Low cost—easy terms.**

Enroll Now! FREE BOOK, "Art for Pleasure and Profit," fully describes course, instruction service, and commercial opportunities for you. TWO ART OUTFITS and other features included with training. **Ask for New Trial Plan.**

MAIL COUPON TODAY • NO SALESMEN WILL CALL

WASHINGTON SCHOOL OF ART
Studio 1310A, Washington 5, D. C.

Please send me full information and your Free Book, "Art for Pleasure and Profit." (*Please print.*)

Name ..... *Age* .....

Street .....

City ..... Zone ..... State .....

☐ *I am interested in your new Trial Enrollment Plan.*

Copyrighted material

TECHNICIANS WANTED

GAPS IN INDUSTRY MUST BE FILLED BY MEN TRAINED TO HIGH STANDARDS . . .

The man who really has the "know-how" will win the best rank and position and the highest pay.

"Engineering Opportunities" lists many specialized home study courses written by world authorities in: Aeronautical, Civil, Mechanical, Mining, Petroleum, Structural, Electrical, Radio, Television and Plastics, etc. Send today for your free copy of "Engineering Opportunities" to Canadian Institute of Science and Technology Limited, 526 Century Building, 412, 5th Street, N.W., Washington, D.C.

FREE 150 PAGES

Canadian Institute of Science & Technology Limited, 526 Century Building, 412, 5th Street, N.W., Washington, D.C.

Please forward free of cost or obligation of any kind your 150-page handbook, "ENGINEERING OPPORTUNITIES".

Name.....

Address.....

Course interested in.....Age.....

Canadian enquiries: 263 Adelaide St. W., Toronto 1

NO SHOP NEEDED

Operate YOUR OWN Business

Clean and Mothproof Rugs and Upholstery

Can you qualify? . . . If you are dependable, honest and willing to work, send for FREE Booklet explaining how you can become "your own boss" in a growing business of your own. You'll use proven successful methods of established DURACLEAN Dealers. Service rendered "in the home," offices and public buildings. Easy to learn. No experience necessary.

DURACLEAN cleans by absorption! No scrubbing. No soaking or shrinkage. Fabrics dry in just a few hours. Dirt, grease and many unsightly spots vanish as if by magic . . . colors revive. Upholstery and floor coverings last longer.

DURAPROOF kills moths and carpet beetles. Makes material resistant to both! Another year 'round service. DURAPROOF, to our knowledge, is the only moth proof service backed by a National Money Back, 4 YEAR WARRANTY of protection. Also rendered "In the Home," at your customer's convenience.

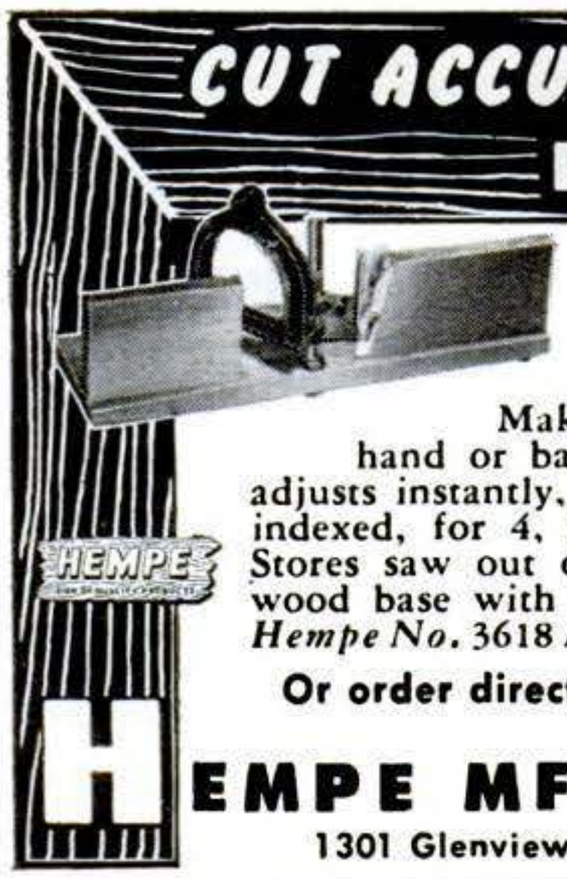
These services are Nationally Advertised! Leading furniture and department stores recommend DURACLEAN Dealer's service. Almost every building in your territory houses a potential customer. Even auto dealers buy your service to revive upholstery in used cars. You get many voluntary and repeat orders.

Some dealers establish a shop or an office after business has grown. Others continue to operate from their own home. Profits up to $15 for a day's service on EACH of your service men.

Territories are limited! Write now for FREE Booklet explaining details of these Nationally Advertised services.

Duraclean Co., 1-180 Duraclean Bldg., Deerfield, Ill.

CUT ACCURATE ANGLES EVERY TIME!



EASY WITH NEW HEMPE MITRE BOX

Makes *accurate* cuts with ANY hand or back saw. 3-bearing saw guide, adjusts instantly, locks to any angle. Quadrant indexed, for 4, 5, 6, 8, and 20-sided figures. Stores saw out of way. Close tolerance hardwood base with non-slip rubber feet. Buy the *Hempe No. 3618 Mitre Box Today* at your dealer.

Or order direct... ONLY $8.00 postpaid

HEMPE MFG. CO., DEPT. S.,
1301 Glenview Pl., Milwaukee 13, Wis.

NEW!

TIRE—TUBE—WHEEL *Complete!*

Includes: choice of "balloon" or "heavy-duty" tread 10½"x4" 6-ply tire (standard, replaceable); tube; and choice of 3 wheels:

For slow-moving dollies, barrows, small tractors, etc.:

A. Pressed steel wheel, ⅝" dia. oilite bearing.....$8.95

B. Pressed steel wheel, ¾" dia. oilite bearing.....$8.95

For high-speed car trailers, etc.:

C. Cast aluminum wheel, 1" Timkin roller bearing.....$12.95

All prices freight prepaid. 5% discount on 4 or more units. Immediate delivery. Send check or M. O.—no C.O.D.'s.

CRAFT, INC., Dept. PS-10, 6671 Telegraph Rd., Los Angeles 22, Calif.

---

learn to HYPNOTIZE!

Command others with hypnotic power! Amaze everyone with your new spellbinding technique. New easy to master course teaches you this mystic art, quickly, expertly, professionally. Have subjects at your mercy. Make them obey your every desire. Send for this Valuable Book Now! Just pin $1 to this ad and "25 lessons in Hypnotism" will be mailed to you postpaid. Satisfaction guaranteed or your money back.

Books Publishing Co., 56 W. 24th St., New York 10, N. Y.

SAFELY RELIEVES

HANGOVER BLUES

Nausea, Upset Stomach, Headaches

FEEL GREAT . . . IN A JIFFY!

STADE works four ways. Overcomes Alcoholic Depression, Absorbs Gases and Toxins, Reduces Gastric-Hyperacidity. Relieves Pain. Doctors' tests prove STADE is safe, effective and contains no laxatives. Sold on Money Back Guarantee. At your dealer or send today.

UNITED PHARMACAL PRODUCTS, INC.
Dept. A10, 176 W. Adams, Chicago 3
Canada: 169 Bessborough, Toronto 17, Ont.

SEND NO MONEY

Just name and address on postal. Pay Mailman $1.00 plus postage. Or send $1.00 now and we pay postage.

Buy U. S. Savings Bonds

Fix It Yourself

Save yourself a lot of expense by doing your own odd repair jobs. Get this new addition of a famous book, showing with diagrams and directions, how to fix and repair furniture, electric outlets, windows, doors, leaky pipes, floor boards, chimneys, boilers, weather proofing, painting and hundreds of other construction and repair jobs. Picture diagrams show how each job is done. Full cloth bound de luxe edition only $1.49.

POPULAR SCIENCE MONTHLY, DEPT. 1051
353 FOURTH AVE. NEW YORK 10, N. Y.

Copyrighted material

TEST YOUR OWN RADIO AND TELEVISION TUBES AT HOME!!!

Pat. Pending

CONDUCTANCE

TUBE TESTER

No knowledge of tubes necessary—100% accurate for direct shorts, opens, burned out tubes.
Buy it—Try it—If not satisfied, return in 5 days—Money cheerfully refunded.

ONLY $3.98

SEND NO MONEY—ORDER C.O.D., or send check, cash or money order & we pay postage.

E-Z TESTER CO. (Dept. P.S.) Macon, Ga.

FALSE TEETH

KLUTCH holds them tighter

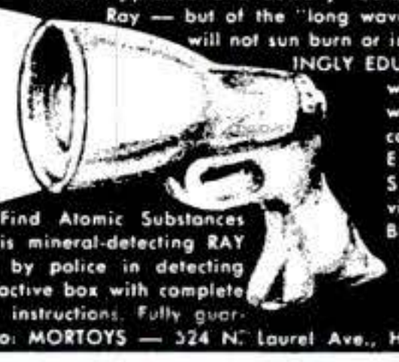
KLUTCH forms a comfort cushion; holds dental plates so much firmer and snugger that one can eat and talk with greater comfort and security; in many cases almost as well as with natural teeth. Klutch lessens the constant fear of a dropping, rocking, chafing plate. 25c and 50c at druggists. . . . If your druggist hasn't it, **don't waste money on substitutes,** but send us 10c and we will mail you a generous trial box.

KLUTCH CO., Box 5194-J, ELMIRA, N. Y.

ULTRA-VIOLET RAY PISTOL

THE REAL THING!! ONLY $4.95

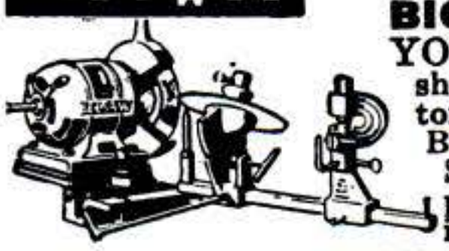
This handsome, electrically operated PISTOL is Underwriter Approved and actually radiates an Ultra Violet Ray — but of the "long wave" variety — which will not sun burn or impair vision! AMAZINGLY EDUCATIONAL! Creates weird color effects where there is no color — with FLUORESCENT chemicals. SECRET MESSAGES visible only under a BLACK LIGHT!



Find Atomic Substances with this mineral-detecting RAY PISTOL! Used by police in detecting CRIME! Comes in attractive box with complete set of chemicals, filter, and instructions. Fully guaranteed. Send cash or money order TODAY to: MORTOYS — 524 N. Laurel Ave., Hollywood 48, Calif.

IMMEDIATE DELIVERY!

CA$H IN YOUR SPARE TIME



BIG MONEY IN OWN BUSINESS

YOU CAN MAKE UP TO $40 A DAY sharpening and setting circular saws for factories, builders, lumber yards -- with NEW BELSAW COMPLETE CIRCULAR SAW SHOP. LOW COST, Sharpens 4 to 5 saws per hour, *no experience needed*, complete instructions. Send today for FREE Catalog.

BELSAW MACHINERY CO
4404 Field Bldg. Kansas City 2, Mo.

"Radio For The Millions" shows:— HOW TO BUILD 78 RADIOS— PHONOGRAPHS—OTHER SETS!

The giant book, *Radio For The Millions* tells you how to build 78 radios and phonographs! Imagine! 192 pages, 648 pictures on building an 8-tube FM set, a 2-way radio station, bicycle radio, floor lamp set, vest pocket portable, midget AC-DC set, superhet, high-fidelity amplifier, all-wave receiver, home recorder, etc. Plus full details on "trouble-shooting" and handsome cabinet suggestions! So *order now—send no money!* When book arrives, pay postman only $1.98 plus postal charges for handsome Deluxe edition. If after 7 days' free trial you aren't delighted, return it for full refund. Mail your order right away to:—

POPULAR SCIENCE, Dept. 1051, 353 4th Ave., N. Y. 10, N. Y.

BARGAINS FROM AMERICA'S *Leading* BINOCULAR RETAILER

Outdoor Life editor wrote (after testing 2 pair UNITED BINOCULARS) "The Vest Pocket 7 Power is surprisingly good—amazing in fact, the 7 x 35 is a fine binocular for all general requirements and your 12 x 50 a remarkable glass, etc."

16x50 COATED $69.50

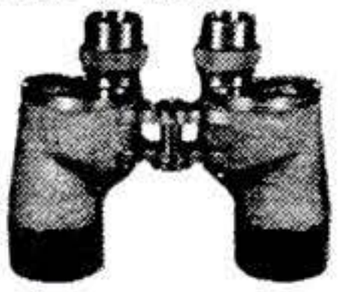
BRAND NEW. Quality glasses. Achromatic lens! Have precision ground optics, lightweight metal bodies. Moisture-Dust proofed.

Easy to Hold
Easy to Focus

The ultimate in a fine binocular. Tremendous power. **Featherweight** (weighs only 24 oz!) Precision made in every detail. COATED, providing sharper, brighter images. Individual focus. Objective lens is 50mm (2 in.) across!

10 x 30 $39.50
6x30—$27.95
8x30—$32.50

COATED for sharper, clearer images. Three (3) superb **FEATHERWEIGHT** glasses. Weigh only 16 to 18 ounces each. Each measures a compact 4½" x 6". Only in power and price do they differ. Each offers an excellent field of view.



WEIGHS 17 OZ! 7 x 35 COATED $45.50

An all purpose binocular. Gives exceptionally sharp, brilliant images. Moisture-Dust proofed. Individually focussing eye pieces. Also 8x40—**$54.50.** SAME MODEL IN CENTER focus with individually focussing right eye piece 7x35—**$49.50; 7x40—$52.50;** 8x40—**$62.50.**

15 to 40 POWER

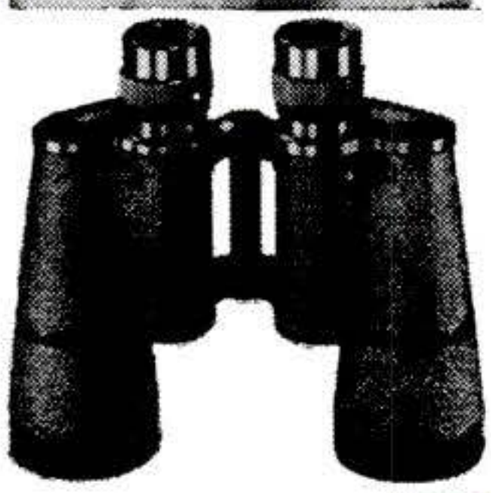
$30.75 COATED

SIX TELESCOPES IN ONE! American-made Wollensak telescope. Instant focussing at 15x, 20x, 30x, and 40x, etc. Turn power tube to click—no guesswork. Telescope measures 9" closed, 27" when extended. Weighs only 18 oz.! Has rustproof chrome tubes, large 40mm objective lens. All 12 optic surfaces are COATED. See .22 bullet holes clearly at 300 feet. Use also for astronomical observation. **$30.75** price **includes** tax and fine leather case.

6 POWER BINOCULAR $16.95

Also 7 Power $21.95

COATED! Pocket size—weigh only 4 oz. and 7 oz. respectively! Field of 370 ft. at 1000 yds.! Precision constructed PRISM binoculars. Not Field Glasses. Made of light-weight, durable, clack and chrome metal. Achromatic lens. *Carry the UNITED seal of quality.*



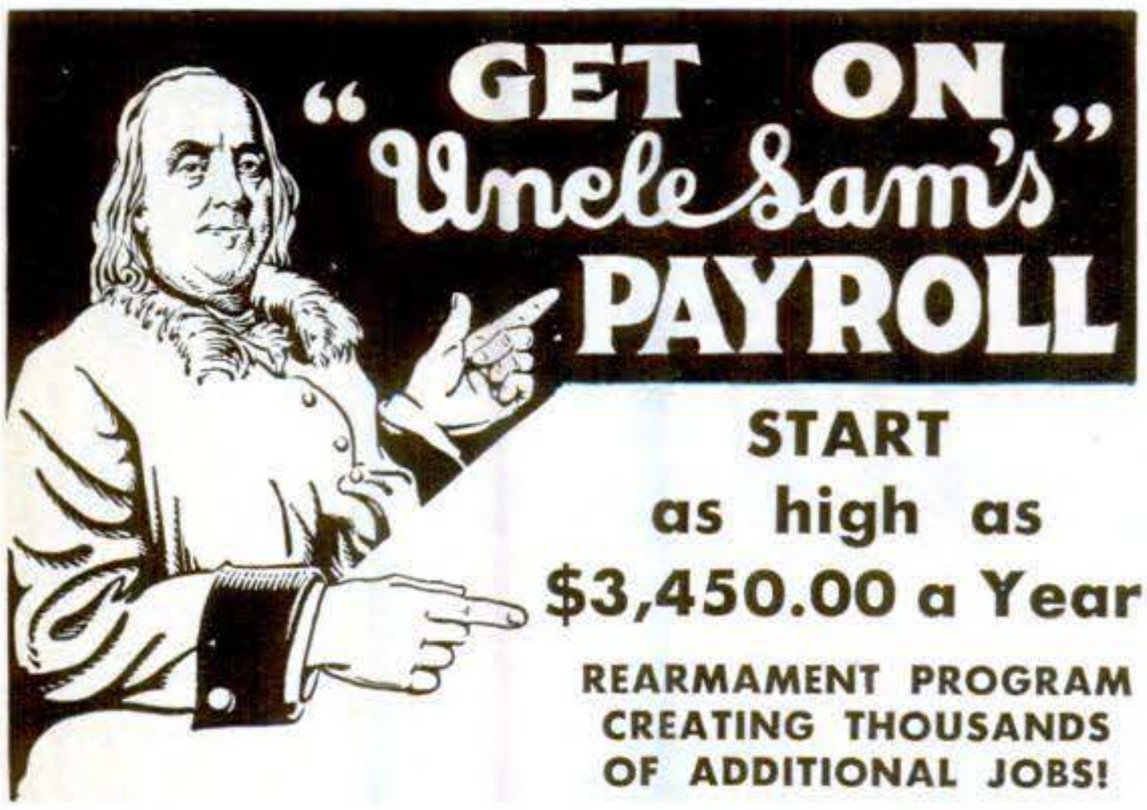
7 x 50 $39.50
8x40—$49.50
10x50—$62.00
12x50—$65.00

Powerful, precision made glasses. Achromatic lens. Individual eye focussing. Superb glasses of quality construction.

UNCONDITIONALLY GUARANTEED. Try For 20 Days At Our Risk! If not fully satisfied return for full refund! Cash orders rushed postpaid. On C.O.D.'s include $2.00 deposit. Add Federal tax. Prices include genuine leather case and straps.

UNITED BINOCULAR COMPANY
9043 S. Western Ave., Dept. ARF-4816, Chicago 20, Ill.
Display Salesroom open Mon. thru Fri. 9:00 AM—3:30 PM

Copyrighted material



START
as high as
$3,450.00 a Year

REARMAMENT PROGRAM
CREATING THOUSANDS
OF ADDITIONAL JOBS!

VETERANS GET
SPECIAL PREFERENCE

Railway Postal Clerks
City Mail Carriers
City Postoffice Clerks
Stenographers-Typists
Liquor Inspectors
Messengers, Etc.

32-Page Book
on Civil Service
FREE.

Mail
Coupon
today—
SURE

COUPON

FRANKLIN
INSTITUTE
(Not Government Controlled)
Dept. A-80
Rochester 4, N. Y.

Rush to me, entirely free of charge, 32-page book with: (1) A full description of U. S. Government jobs; (2) A list of U. S. Government jobs; (3) Tell me how to qualify for a job.

Name .....

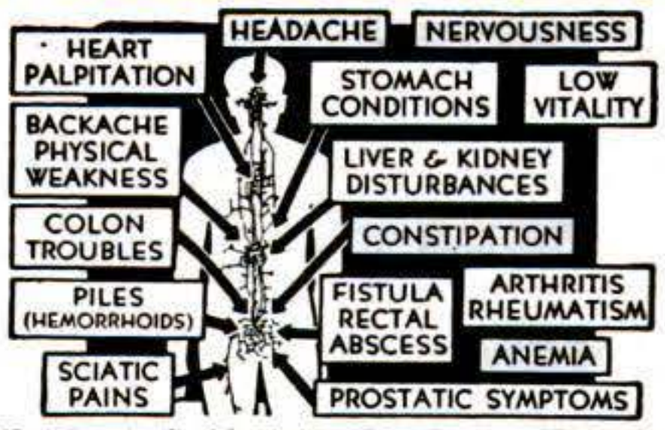
Street .....

City.....Age.....

★

Fistula May Often Result From Piles

FREE BOOK — Gives Facts On Associated Ailments



A new, illustrated 40-page book on Fistula, Rectal Abscess. Piles and other rectal and colon disorders is now FREE to all sufferers. Write today—a card will do. Thornton & Minor Hospital, Suite 1049, 911 E. Linwood, Kansas City 3, Mo.

12 Months Driving for $4.95

A new tire guarantee with each tire.
Positively Not Re-Caps—Every Tire Machine Inspected

600-16 **$4.95** Two for **$9.50** 650-16 **$5.50**
670-15 **$5.95** 700-15 **$5.95**

Send this ad with order. Mail orders rushed on receipt of check or money order for the size desired.
Dept. A
West Park Tire Sales, 14018 Beech Ave., Cleveland, O.

MAKE MONEY with Bostonian SHIRTS

TAKE orders for old, reliable line finest quality dress and sport shirts. All styles ...fabrics...colors...sizes. Sensational LOW PRICES. No experience needed. **FREE** Samples of actual fabrics and big Style Kit waiting for you! Send no money, but rush name NOW! **BOSTONIAN MFG. CO.,** 39BickfordSt.,Dept.K-41,Boston30,Mass.

make your own Gems 29.50 F.O.B.

All necessary lapidary equipment is furnished, including a super-charged diamond blade for sawing, and all wheels for grinding, shaping and polishing; also complete instructions. The complete equipment as shown, less motor and belt, for only $29.50, f.o.b., Burlington, Wisconsin. Write today for information and literature.

B&I MANUFACTURING CO.
Dept. M Burlington, Wis.

FREE

NEW BIG RADIO CATALOG

Ready now! Complete with everything in radio, TV and electronics. Newest parts as well as old, standard lines. Paste coupon on penny postcard and mail today!

Lafayette Radio DIV.: RADIO WIRE TELEVISION, INC.

NEW YORK 13.....100 Sixth Avenue
NEWARK 2.....24 Central Avenue
BOSTON 10.....110 Federal Street
BRONX 58.....542 E. Fordham Road

30 YEARS OF VALUES

LAFAYETTE RADIO, Dept. KI-1
100 Sixth Avenue, New York 13
Please rush Free catalog to:

Name.....

Address.....

City.....State.....

PASTE ON PENNY POSTCARD

BE A HIGH-PAID MAN IN YOUR COMMUNITY WITH THIS LONG NEEDED INVENTION

Earn up to $10,000 or more per year! Nothing to invest! Be your own boss! U.S. Pat. D 153853-D 153854

A worldwide product needed by every home, business and farm...priced to sell quickly! Automatic Red Comet goes into action as soon as fire starts... smothers fire without human aid. It's a sales 'natural'!

FREE SALES KIT

Demonstrator units, sales literature, etc., furnished you FREE. Handsome leather-type kit. Tried and proved, it will make you an independent businessman. ACT NOW! Someone in your community will be appointed soon. **Write for details, today!**

RED COMET, INC.
Dept. 24-A R. C. Bldg., Littleton, Colo.

Copyrighted material

I'll show you how to EARN BIG MONEY IN PLASTICS

without tools or machinery!

A NEW HOME INDUSTRY

NEVER BEFORE has such a **GREAT OPPORTUNITY** like this been offered! The **CHANCE OF A LIFETIME!** The chance to learn and **START** a new, fascinating and **HIGHLY PROFITABLE** business of your own! We have started **THOUSANDS** of ambitious people in this wonderful and thrilling new business because the work is so easy and pleasant (many turn it into a profitable hobby), requires only a **FEW** dollars investment, can be started **ANYWHERE** by **ANYONE** . . . at home, garage, basement, den, shop, etc., and most important, **WITHOUT TOOLS OR MACHINERY** you can produce in **QUANTITY** exceptionally attractive and desirable plastic things of such great variety and usefulness beyond your imagination! All this valuable knowledge and instruction is yours **FREE** . . . we teach you, help you get started and **buy part of your production!** We also help you obtain DEFENSE WORK!

MAKE ANYTHING

This new method of creating unlimited quantities of useful things without machinery is **CASTING** . . . the extremely simple process of pouring liquid plastics into molds; *the entire method is as easy as pouring water out of a glass.* No machinery or tools required! In a few minutes the liquid turns into a beautiful solid, hard, durable, colorful or transparent plastic in the form of Jewelry, Novelties, Gadgets of every shape and form, Machine Parts, Fishing Lures, Bookends, Cig. Lighters, Tools, Dies, Handles, Knobs, Pensets, Figurines, Souvenirs, Toys, Dolls, Baby Shoes . . . **A THOUSAND USEFUL THINGS!** Some of our plastics are transparent and sparkling clear, ideal for imbedding flowers, photos, curios, etc. Others are like beautiful Ivory, Ebony, Marble, Ceramics, Etc. The field is really **UNLIMITED.** Practically anything your imagination can create can be **CAST** with our plastics, one or a thousand!

BILLIONS FOR DEFENSE

The government has started the greatest defense program in history! **BILLIONS** are being spent! Our liquid plastics can be used in **THOUSANDS** of vital defense applications. With our catalog we will include instructions how **YOU** can obtain defense work, how **YOU** can take part in this tremendous program to insure the future of America! A grand opportunity to combine patriotism and profit! A grand opportunity of obtaining THOUSANDS OF DOLLARS of defense work!

1000 OPPORTUNITIES

Regardless what you are doing now you can get into the **CASTING BUSINESS** in your spare time or evenings; we assure you, once you do, you will be eagerly devoting all of your time to this very easy, fascinating and **HIGHLY PROFITABLE** business. Countless letters from enthusiastic busy **PLASTICAST** users testify to successful businesses developed as a result of answering this ad! **BUT LET US PROVE IT:** send only 25c for our big 48 page catalog of Casting Materials, Molds, etc. We will also send you, absolutely **FREE,** an attractive **CASTING** to show you what can be done with our plastics in a few minutes! IN ADDITION, we will also send you a valuable instruction book giving details on the **ART & BUSINESS OF CASTING!** Yes, all this for only 25c, but write for it today . . . *this may be the lucky coin that will start the most fascinating and profitable phase of your life!* Don't delay anything that can mean so much to your future—write today.

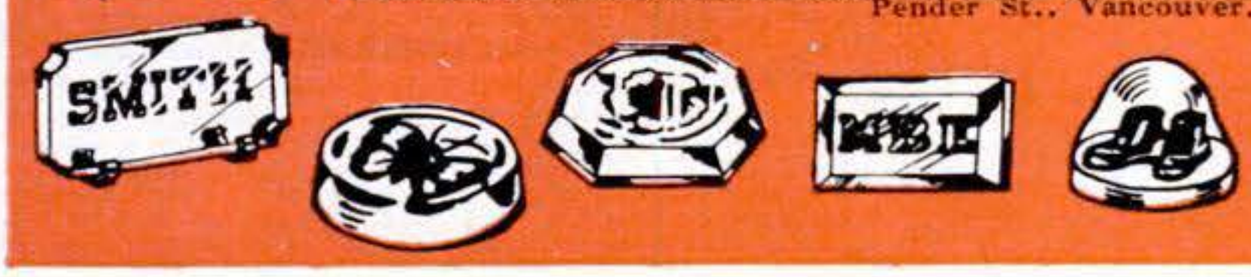
PLASTICAST CO. (Dept. A)

P. O. Box 6737
Chicago 80, Ill.

Write to either address

P. O. Box 987
Palo Alto, Calif.

CANADIAN CUSTOMERS: Send 35c for catalog to Canadian Ind. Plastics, 1056½ W. Pender St., Vancouver, B. C.

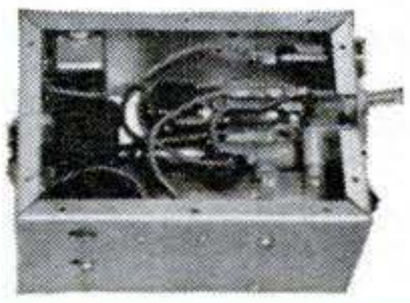


FREE

WAR SURPLUS INSTRUMENTS—RADIO—CAMERAS

ELGIN—WALTHAM—BULOVA

Waterproof, shockproof, Type A-11 hack watch. 16 J black face, white numerals. Sweep second hand. Used by AAF. Built to exact specifications of U. S. Govt. Genuine War Surplus. State first and second choice as limited quantity available.
ONLY **$19.75**
Add $1.98 Federal Tax



MINIATURE COMPRESSOR

2 piston air compressor operated by 24 V series wound motor. Can be used AC or DC. Equipped with dual thermo cutoff for motor and compressor. Positive regulator 2 to 15 PSI. Popoff safety valve. Usable as vacuum or pressure pump. Ideal for jewelers, dentists, air brush work and aerating fish ponds.
NOW **$10.95**

DESK MICROPHONE

A precision built microphone, usable for intercom, P.A. systems, sound projectors, etc., **ONLY** **$2.95**

MAGNESYN INDICATOR

For remote indicating compass. Automatic direction finder. Calibrated from 0 to 360 degrees.
Govt. Cost $90.00.....NOW **$3.75**

PHOTO PAPER & FILM

9⅜" X 200' Bromide enlarging—contrast #1 ..... **$3.95** roll
7" X 125' Aero enlarging—contrast #1 ..... **$1.95** roll
16 mm. X 50' Magazine—Super X, developing included **$2.50**
16 mm. X 100' Super X—negative **$1.50**

War surplus—outdated but Guaranteed. Send your inquiries for World's Largest Selection of Surplus Aerial Camera and Radio Test Equipment.

SOUND POWERED PHONE

No batteries needed. Your voice generates current. O.K. for 25 miles. Perfect intercom for shop, office, farm, darkroom. WAR SURPLUS. Orig. Govt. Cost $58.00 ea.,
NOW **$10.95**

KOLLSMAN ALTIMETER

For auto or airplane. Used, guaranteed accurate. Govt. cost $168.00.
NOW **$10.95**

HEAD PHONES

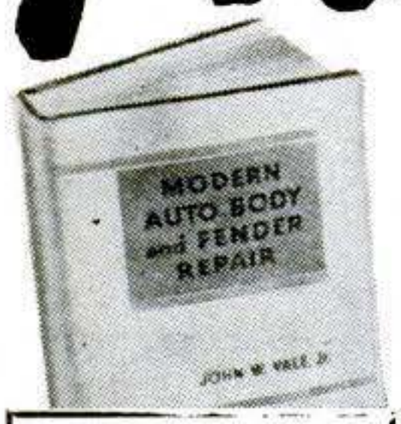
Govt. specification Head Sets. Used but guaranteed.
ONLY **$1.59**

All merchandise guaranteed. Order these Surplus Bargains Today
20% Deposit on C.O.D.'s Minimum Order $2.00.

Semlers' ASSOCIATED SURPLUS Dept. P-111 5730 WILSHIRE BLVD., LOS ANGELES 36, CALIF.

Copyrighted material

NOW YOU CAN FIX AUTO BODIES and FENDERS Like an Expert!



Here is "know-how" that saves you $$$$ on:

- wheel alignment
- suspension
- woodworking
- metal working
- welding
- frame repair
- upholstering
- finishing
- *and much more!*

Get this brand-new, COMPLETE handbook for sure-fire working knowledge of auto body and fender repair. COVERS ALL MODELS AND MAKES OF CARS. Tells you how to do professionally-perfect jobs on: straightening a fender brace, hood section repair, fender-hood alignment, front-end alignment, toe-in checking and adjustment, rear springs and mountings, aligning bumpers, swayed and sagged frames, top section repairs, hardware, wheels and tires, lights and wiring, AND MUCH MORE. Simple, down-to-earth language gives you step-by-step directions. Hundreds of cut-away photos and diagrams make each procedure crystal-clear. Packed with latest dollar-saving short-cuts plus proven techniques for top-notch workmanship. This handbook can SAVE YOU HUNDREDS OF DOLLARS in repair bills.

FREE 10-DAY TRIAL Send no money. Just mail coupon to get "Modern Auto Body & Fender Repair" for FREE 10-day trial.

Prentice-Hall Inc., Dept. M-PS-1051
70 Fifth Ave., New York 11, N. Y.
Send me for 10-DAYS' TRIAL, "Modern Auto Body and Fender Repair." I will either return it in ten days and pay nothing—or keep it and send only $1.00 down (plus postage) and then $2 monthly for 2 months.

Name.....
Address.....
City.....State.....

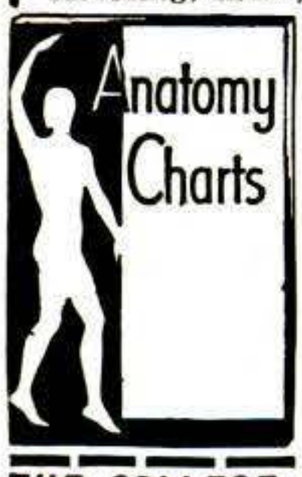
☐ SAVE! Send $5 WITH THIS COUPON and we pay postage. Same return and refund privilege.

Learn this Profitable Profession

IN 90 DAYS AT HOME

Money-Making Career Open to Men and Women, 18 to 60

Hundreds of men and women between 18 and 60 make $10 to $20 in a single day giving scientific Swedish Massage and Hydro-Therapy treatments. There is big demand from doctors, hospitals, sanatoriums and clubs. Graduates earn large full time incomes from these or in private practice in their own offices. Others make good money from home treatments given in spare time. Learn this interesting, money-making profession in your own home, through our home study course. Same instructors as in our **nationally known** resident school. **You** can win independence and prepare for future security by qualifying for your Diploma. Course can be completed in 3 to 4 months. Many earn while they learn. Begin **your** training at once.



NEW 32-PAGE BOOKLET *FREE*

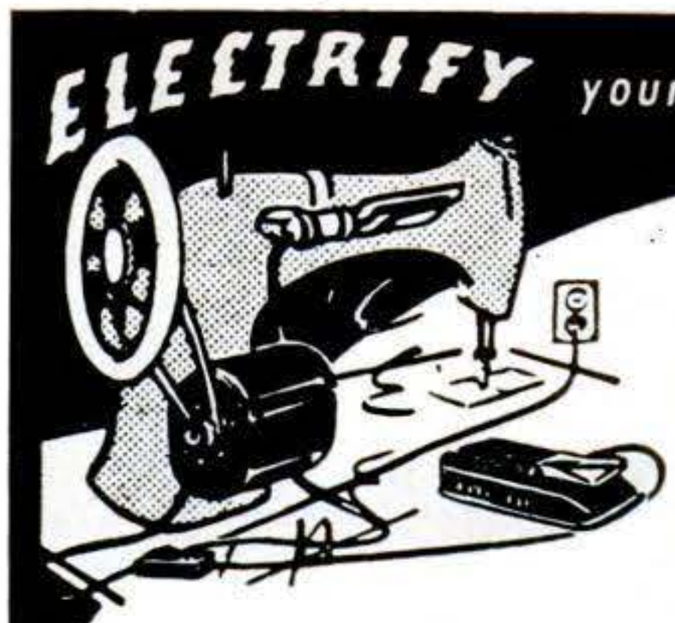
Fill in the coupon below (please print name and address) and mail it for your FREE copy of 32-page Information Booklet. If you act at once we will include Anatomy Charts and Success Booklet which supply additional information you should have. All will be sent postage paid.

THE COLLEGE OF SWEDISH MASSAGE
Dept. 170M, 41 E. Pearson St., Chicago 11, Illinois

Please send me FREE and postpaid New 32-Page Illustrated Booklet, Anatomy Charts and Success Booklet at once.

Name.....Age.....
Address.....
City.....State.....

ELECTRIFY your SEWING MACHINE



NEW LOW PRICE!
$12.50 1 YR. GUARANTEE

Buy direct from manufacturer and save! Kit comes fully wired, installed in a jiffy. Fits all machines! You get all these **new parts!**

- **Motor & Bracket**
- **AC-DC 115v 60c**
- **Multi-speed foot control**
- **Cord set & block**
- **Easy instructions**
- **Steel pulley & belt**

FREE, reg. **$2.95 Chrome SEWLITE given with kit.**
10 DAY FREE TRIAL—ORDER NOW!
Send no money, pay C.O.D. or send money order and we'll pay postage. Please state whether wheel on your machine turns toward you or away from you. Shipping wt. 6 lbs.

SENIOR SEWING MACHINE CO.
1046 Bedford Avenue Dept. PS-30 Brooklyn 5, N. Y.

TREASURE HUNTERS—PROSPECTORS
SELECTIVE METAL & MINERAL DETECTOR

A highly sensitive detector of revolutionary new design. Readily distinguishes metals from black sands, etc. Ideal for finding placer deposits. Write for free literature.

GARDINER ELECTRONICS CO., Dept. PS
2018 N. Dayton Phoenix, Arizona

Bar Bells

BUY DIRECT FROM FACTORY **$8.95 up**
Approved and Recommended by Karl Koberle, (Foremost Ex-Army Instructor on Weight Training.)
Write for free booklet and price list.
INDEPENDENT IRON WORKS
2416 E. 23rd. Street, Dept. C, Los Angeles 58, Calif.

WARN HUB CAP MAKES 2 JEEPS OUT OF 1

Ends front wheel drag on 4-wheel drive Willys Station Wagons, Pick-ups and Jeeps

$20.00 Prepaid U. S., Canada

Saves gas up to 5 miles per gallon, tire wear, front axles, increases speed and power. Stops shimmy—front wheels coast out of gear! 4-wheel drive handles, performs, climbs like 2-wheel. Install or remove WARN HUB CAPS in 10 minutes. Polished aluminum, guaranteed. Rush check, M.O., or C.O.D. Write for circular.

WARN MFG. CO., - Dept. S, 1625 3rd Ave., Seattle 1, Wash.

ELECTRIC MOTOR BARGAINS!

½ HP 1750 RPM **19.75** ¾ HP 1750 RPM **32.00**
½ HP 3450 RPM ¾ HP 3450 RPM
1 HP 3450 RPM 39.00 **1½ HP 3450 RPM 47.50**

Every Motor Fully Guaranteed

Immediate Delivery

Heavy Duty, Repulsion Induction and Capacitor Types, 110-220 Volts, 60-cycle, Single-phase. Standard Makes (G. E., Wagner, Leland, Westinghouse, etc.). Rush your order **TODAY**—large stock of motors—1 & 3 phase. **32-v. direct current bargains. Prices f.o.b.**

ROBERTS ELECTRIC CO., 849 W. Grand, Dept. 12, Chicago

Ugly BLACKHEADS out in Seconds or NO COST!

Try VACUTEX Blackhead-Remover

The amazingly effective Vacutex extracts Blackheads automatically — WITHOUT squeezing the skin or injuring tissues. Easy to use with three fingers. It reaches Blackheads anywhere. Try it 10 days and if not delighted, return VACUTEX and your dollar will be refunded

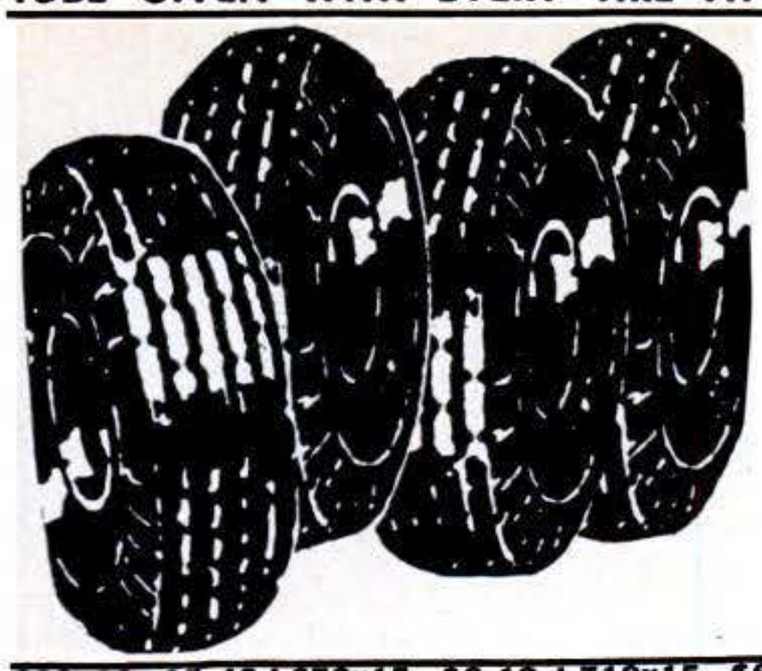
$1.00

10 DAY TRIAL COUPON

BALLCO PRODUCTS CO., Dept. 103
19 West 44th St., N. Y. 18, N. Y.
☐ Enclosed find $1. Send postpaid.
☐ Send C.O.D. I will pay postman $1 plus postage; $1 refund if not delighted.
SORRY, NO C. O. D.'s OUTSIDE U. S. A.

Copyrighted material

TUBE GIVEN WITH EVERY TIRE AT NO EXTRA COST



WRITTEN GUARANTEE SENT WITH EVERY TIRE YOU BUY

PLEASE NOTE: Our Tires are NOT Re-Treaded or Re-Capped

GOOD USED TIRES

A TRIAL OF ONE TIRE WILL CONVINCE YOU.

TUBE GIVEN WITH EACH PASSENGER & TRUCK TIRE AT NO EXTRA COST SEND THIS AD

If your size is not listed write for prices.

18 YEARS AT THIS ADDRESS.

600x16	$5.42	670x15	$6.12	710x15	$6.12	760x16	$7.42
650x15	5.82	700x15	6.42	750x16	7.72	820x15	7.00
650x16	6.22	700x16	5.92	760x15	6.42	550x17	5.72

600x20	$9.72	32x6(8)	$10.42	1000x20	$18.42
650x20	9.92	32x6(10)	13.82	1100x20	18.42
700x20	11.72	825x20	18.00	1000x22	17.42
750x20	12.42	900x20	17.72	1100x22	18.42

Thousands of tires shipped all over U.S.A. All tires shipped F.O.B. Phila. Send Check or M.O. with this ad. Dept. 5.

STANDARD 834 N. Broad St., Philadelphia 30, Pa.

TRADE MAGAZINES HELP YOU TO SUCCESS

Get latest copies through our Easy-To-Get-Acquainted Service. Nearly 1200 business, professional, construction, health, motel, oil, travel, mail order, hobby, music, pets, photography, plastics, sports, television, selling, agricultural and others covering all interests. Send for LIST today. It's FREE.

COMMERCIAL ENGRAVING PUBLISHING CO.
34AE North Ritter Ave. Indianapolis 19, Indiana

MANUFACTURE BUILDING BLOCKS

Only $218

Easy to start your own profitable business. General high speed, low cost Concrete Vibrator Block Machine produces 1000 blocks in 8-hour day. All sizes and shapes. Complete details FREE. Mail $1 for wonderful book, "How to Build Your Own Concrete Block Home."

GENERAL ENGINES CO.
307 HUNTER ST., S-101 GLOUCESTER, N. J.

ITALIAN ACCORDIONS

All types, all models, Very best. Hand Made. Fully guaranteed. Buy direct from Factory representative at lowest wholesale prices, and Save Money. Also Button Accordions, Chromatic Accordions and Concertinas. We take any instruments in trade. Send name and Address for FREE catalog.

ITALIAN ACCORDION MFG. CO.
7600 Cottage Grove Ave., Dept. PS-10, Chicago 19

Borrow $50 to $300 BY MAIL

Confidential Loan Service

Need money? No matter where you live... you can borrow **BY MAIL**, $50.00 to $300.00 this easy, quick, **confidential** way. **No endorsers needed.** Employed men and women of good character eligible. Solve your money problems quickly and in complete privacy **with a loan made by mail.** Employer, relatives and friends will not know you're applying for a loan. Convenient monthly payments. Rush coupon—giving occupation—for Application Blank sent FREE in plain envelope. There's no obligation.

STATE FINANCE CO., 210 State Finance Bldg.
Dept. D-13 DES MOINES 8, IOWA

No Endorsers
REPAY ON EASY TERMS
Quick! Easy!
PRIVATE

STATE FINANCE CO., Dept. D-13
210 State Finance Bldg., Des Moines 8, Iowa
Please rush FREE Application Blank.

NAME_____

ADDRESS_____

CITY_____ STATE_____

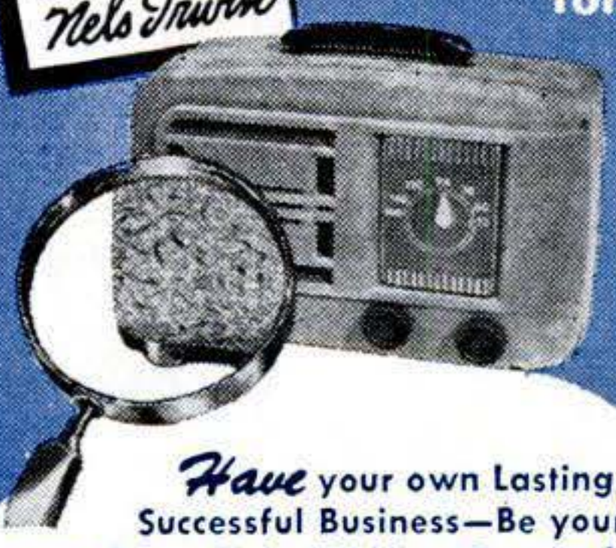
*Occupation*_____ *Age*_____

EXAMINE FIRST!

I'll send you Everything at my Risk. Examine—THEN DECIDE. *Nels Irwin*

YOUR BLUE PRINT FOR BIG PROFIT!

I'll send complete course and kit right to your home for trial. Read all the secrets — *then* DECIDE!



FLOK KRAFT
TRADE MARK REG.

Have **your own Lasting, Successful Business—Be your own Boss—Help Fill Huge Demand.**

Rich profits waiting to be tapped in this new field. New MIRACLE finish gives a velvety, luxurious surface to radios, lamps, toys, signs, store displays, figurines, auto dashboards, and hundreds of other items. Make old objects beautiful and saleable—make new things worth much more with this soft, rich covering—applied to any surface, even if old and worn.

START RIGHT AWAY

Men! Women! Learn in a few days to start MAKING MONEY! Everything needed is furnished, including fully detailed, illustrated instructions that are complete and easy to understand Shows you how to start on the road to big money, full or spare time, in your own home No previous experience or artistic ability needed.

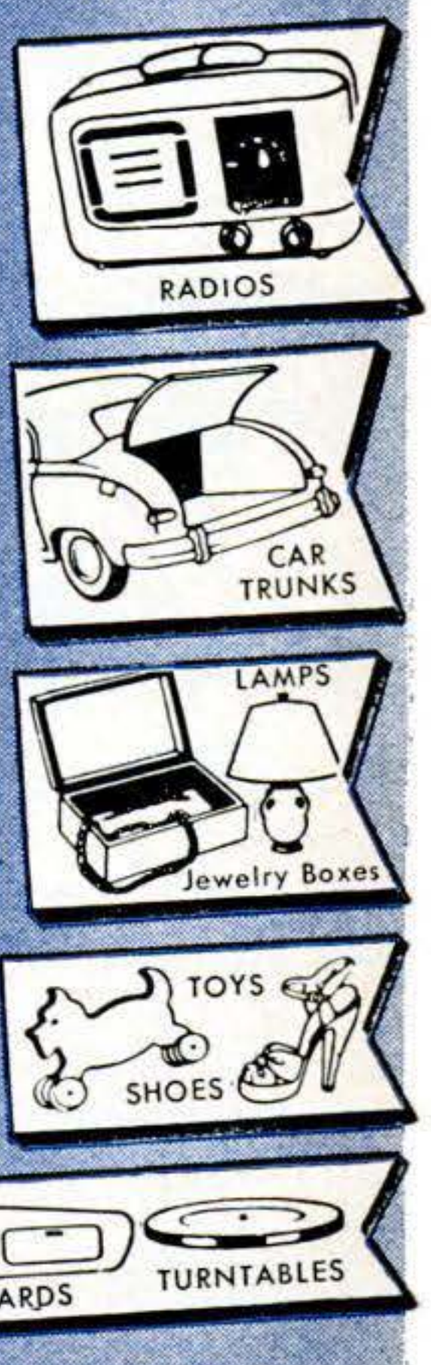
EVERYTHING COMPLETE

In addition you get all equipment and materials to enable you to start at once. *Outfit is complete* including patented high velocity spray gun. You can earn up to $5.00 per hour and more spare — full time Few cents worth of materials means many dollars in return. Boost your present income or start your own profitable business. Our Business is Booming. Help us fill HUGE DEMAND.

ACT NOW!

Grasp this opportunity TODAY — start your own business. It's too good to miss! SEND NO MONEY—fill out the coupon and stick it on a post card or in an envelope and mail today for FREE EXAMINATION request. FREE sample of FLOK-KRAFT covered material, and hundreds of useful and profitable IDEAS Do it NOW—be first! (Air mail is quickest.)

Covers Wood, Fabric, Metal, Glass, Plaster, Plastic or any Surface



COAST INDUSTRIES
Dept. 1A, 1004 S. Los Angeles St., Los Angeles 15, Calif.

EXAMINE! THEN DECIDE! Read all the professional secrets of FLOK-KRAFT.

COAST INDUSTRIES Dept. 1A,
1004 S. Los Angeles St., Los Angeles 15, Calif.
Please *rush* me all the details.

NAME_____

STREET_____

CITY_____ ZONE____ STATE_____

SEND NO MONEY! Get the facts FREE!

Copyrighted material

$200 GROSS IN MY FIRST WEEK!

in a business of my own

• Would you like to own a year-round business in which it is possible to make $200 gross the first week, as did L. A. Eagles? R. E. Traynor says, "I made $62 gross in one day." Others report gross from $100 a day to $12,000 per year.

Surely you want to investigate a golden opportunity like this. No special skill or experience needed. You can start without a large investment . . . and—if ambitious, honest and courteous—you can succeed and make good money year after year.

No shop necessary. Our Electric Rug Washer cleans rugs and carpets like new right on floor . . . quickly removes dirt, grime and restores natural color and beauty. So efficient and safe for carpets, used by largest hotels and railroads.

No risk. Machines fully guaranteed. Mail coupon for full information including how to make big profits fast in YOUR own business. BIG opportunity.

...MAIL TODAY!

VON SCHRADER MFG. CO.
N11PL, Racine, Wis.

Send at once (no obligation) FREE booklet containing information about your Electric Rug Washer and how I can own a permanent, profitable business.

Name_____

Address_____

City_____ Zone_____ State_____

In my spare time I made $10 AN HOUR!

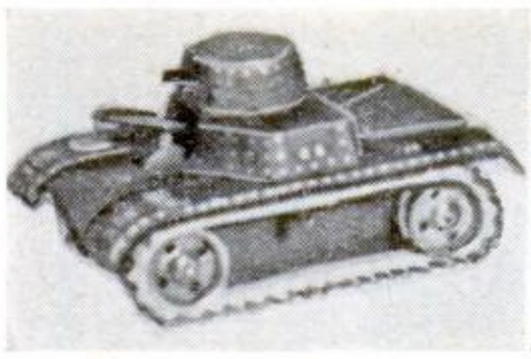
H. SADLER

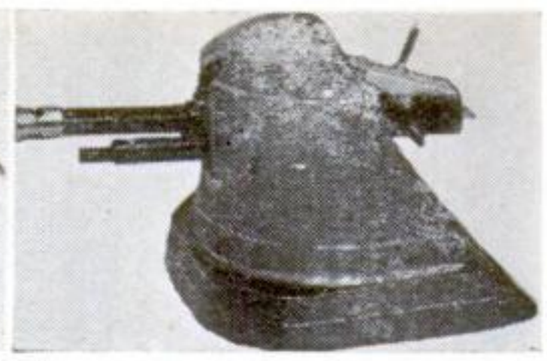
That's what Hugh Sadler earned showing Science's New Midget Miracle, the Presto Fire Extinguisher

Make good money, full or spare time! Folks "go for" this tiny "PRESTO" in big way! About the size of a flashlight—yet ends fire as fast as 3 seconds. Secret is new wonder chemical, specified by U. S. Air Force for fighting fires in B-29's. *Guaranteed 20 years!* Sells for only $3.98! Show it to civil defense workers, owners of homes, cars, boats, farms, etc., and to stores for re-sale—make good income. H. J. Kerr made $20 day. C. Kama, $1,000 month. Write for FREE Sales Kit. No obligation. **MERLITE INDUSTRIES, Inc., Dept. 1110, 201 East 16th Street, New York 3, N. Y.** *IN CANADA: Mopa Co., Ltd., 371 Dowd St., Montreal 1, P. Q. (If you want a regular Presto to use as a demonstrator send $2.50. Money back if you wish.)*

Science's New Midget Miracle—"PRESTO"

REALISTIC IMPORTED MINIATURES





Shooting Tank
Wind it up and away it goes on rubber caterpillar tread, shooting fiery sparks. Metal with turret. 3¾". Postpaid, **$1.25**

Fortress Gun
Shoots projectiles in a realistic but harmless way. Can be cap operated too. All metal, cupola mounting. 2½" high. Postpaid, **$2**

Send 10c, coin or stamps, for our new catalogue

J. J. ANTHONY • Box 402 • Milwaukee, Wis.

BIG MONEY for You

Showing NEW MIRACLE Labor Saving Discovery

MEN! WOMEN! Enjoy amazing profits with new "Miracle" Copper Cote Ironing Pad. **Plastic Coating** saves housewives time, labor, money. 1-minute demonstration sells it. Experience unnecessary.

Write for FREE Sample Offer

Send for FREE facts about COPPER COTE, and our other new fast-selling products. SEND NO MONEY. Write for details, sample offer to

THE SHELDON CO., Dept. 814.
1223 South 23rd St., Milwaukee 46, Wis.

BEING PUSHED AROUND??

Why take any more nonsense from bullys, wise guys and other pests? The next time they try to act smart—give them the surprise of their lives! It's easy when you know POLICE JIU JITSU! This complete, fully illustrated course comes to you in one volume. The same as taught to police, marines, "G" men, soldiers, sailors and members of the U. S. Coast Guard. By all means, just pin $1 to this ad and we will send POLICE JIU JITSU to you postpaid by return mail. Satisfaction guaranteed or your money back.

BOOKS PUBLISHING CO., 56 W. 24th St., N.Y. 10

523 DIFFERENT STAMPS—25¢

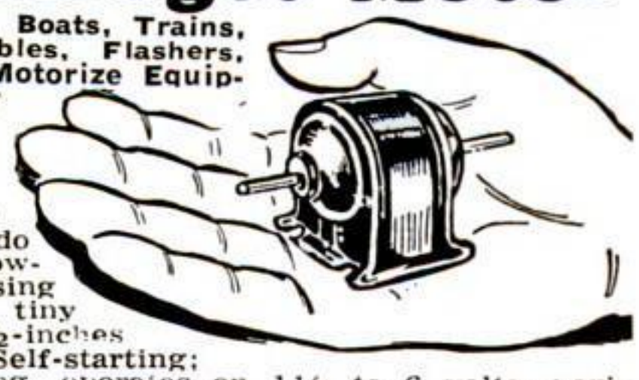
including GOYA NUDE plus FREE Stamp Collecting Book

Spain's most sensational stamp included in this imported collection of 523 different, unusual stamps from dozens of hard-to-get countries! Also included, FREE—book which shows how to identify stamps. Regular $3.00 value—yet ALL yours for only 25¢ with Bargain Approvals. **Send 25¢ today. Ask for Lot EH-2**

ZENITH CO., 95 Nassau St., New York 38, N. Y.

Powerful Midget Motor

Drives Tools, Models, Racers, Boats, Trains, Cars, Rotating Toys, Turntables, Flashers, Moving Signs, Music Boxes. Motorize Equipment, Etc., Etc. Let a motor do your work!



Runs Up to 6000 Rev. Per Min.—Lifts 50 Lbs.

Fun for model builder, yet do hundreds of useful jobs. So powerful it lifts 50 lb. weight (using gear box—see below), yet so tiny weighs only 2 oz. 1x1¼x1½-inches 6000 r.p.m. 1/2000 hp. Self-starting; reversible. Clear plastic housing, operates on 1½ to 6 volts, variable power. Long battery life; permanent magnet. Ready to run.

ORDER NOW—Money Back if Not 100% Satisfied.
MOTOR ONLY (2 for $3.75) POSTPAID EACH..... $1.98

Variable Speed Gear Box—30 to 6000 r.p.m.

Get complete set containing Super-Power Midget Motor and Variable Speed-Power Gear Box. Use together or separately. Multiplies power 200 times to lift up to 50 lbs. Variable speeds from 30 r.p.m. to 6000 rpm. Gear & pulley drive, handbook of uses, motor & gear box. **COMPLETE SET $3.98**

Johnson Smith Co., Dep. 425, Detroit 7, Mich.

Copyrighted material

WAR SURPLUS

OPTICAL BARGAINS

35 POWER ERECTING MICROSCOPE

Amazing clarity. "All-Position" Universal mount, 3" of working space from objective to platform. Prism Erectors give you an erect image—exactly as your eye sees it. Ramsden Eyepiece permits fine precision focusing. 3-Element color corrected objective—1" diameter. Microscope body is of brass with black crackle finish . . . 6½" long with base 7"x9". Easily worth $75.00.

Stock No. 970-N . . . . . $29.50 Postpaid

SLIDE PROJECTOR SETS. Consists of all unmounted lenses you need to make the following size projectors:

Stock #4029-N—35 mm. . . . . **$2.85 Postpaid**
Stock #4038-N—2¼"x2¼" . . . . . **$3.35 Postpaid**
Stock #4039-N—2½"x3½" . . . . . **$3.35 Postpaid**

SIMPLE LENS KITS—Include plainly written, illustrated booklet showing how you can build lots of optical items. Use these lenses in photography and for dozens of other uses in experimental optics, building TELESCOPES, low power Microscopes, etc.

Stock #2-N—10 lenses . . . . . $ 1.00 Postpaid
Stock #5-N—45 lenses . . . . . 5.00 Postpaid
Stock #10-N—80 lenses . . . . . 10.00 Postpaid

We Have Literally Millions of War Surplus Lenses and Prisms for Sale at Bargain Prices. Numerous Types of Instruments, Too! Write for FREE CATALOG-N.

EDMUND SCIENTIFIC CORP., BARRINGTON, N. J.

KIDNEYS MUST REMOVE EXCESS WASTE

Nagging backache, loss of pep and energy, headaches and dizziness may be due to slowdown of kidney function. Doctors say good kidney function is very important to good health. When some everyday condition, such as stress and strain, causes this important function to slow down, many folks suffer nagging backache—feel miserable. Minor bladder irritations due to cold or wrong diet may cause getting up nights or frequent passages.

Don't neglect your kidneys if these conditions bother you. Try Doan's Pills—a mild diuretic. Used successfully by millions for over 50 years. It's amazing how many times Doan's give happy relief from these discomforts—help the 15 miles of kidney tubes and filters flush out waste. Get Doan's Pills today!

I HELPED T.E.H. MAKE $14 A DAY WHILE STILL LEARNING!

T. E. H.—West Virginia. "By the time I finished half your course, I was making $14.00 per day. I have made enough on the side to more than pay for the course."

H. T. ARMSTRONG

ELECTRIC *Learn* APPLIANCE REPAIR & SERVICE

WE TEACH:
How to Repair
Washing Machines
Vacuum Cleaners
Electric Ranges
Lamps, Motors,
Irons, etc.,
REFRIGERATION
and
House Wiring
At Home
In Your
Spare Time!

For a man handy with tools, and happiest when working with his hands, OPPORTUNITY is Wide Open Today in this great and growing field. Everyone is a customer for the man trained to service electric appliances.

Open Your Own Shop

Our practical HOME COURSE teaches you this business from A to Z—preparing you to take a well paid job or open your own shop. You can actually start in your basement or garage with the tools we send you . . . before finishing.

We Include An ELECTRICAL APPLIANCE TESTER
A Big Kit of Tools at NO EXTRA COST

MAIL THIS COUPON for FREE BOOK

H. T. ARMSTRONG
PACIFIC TRAINING SCHOOLS
7217 So. Broadway, Dept. S-5110 Los Angeles 3, Calif.
Dear Sirs: Please send me, without obligation, your free booklet and complete details.

Name_____
Address_____
City_____ Zone____ State_____

MAGIC-SCREEN INCOME PLAN OFFERS BIG MONEY, AT HOME, SPARE OR FULL TIME

Reproduce any painting, design, trade-mark, picture, printing, in full color, on any surface! Proven new method enables you to cash in on *established* business where Profits up to $5.00 or more an hour are being made, *right now!* Examine complete Plan and equipment without risk!

Write today for free sample — Complete free details! **Send NOW!**

CALIF. ACADEMY OF SCREEN PROCESS Dept. 110 5100 SO. VERMONT AVE., LOS ANGELES 37, CALIF.

Special Offer

WORK CLOTHES BARGAINS!

FREE 10 DAY TRIAL

Blue, Tan, White
Measure Neck & Arm

Blue, Tan, White
Measure Waist & Leg

White Only
Send Chest Measure

Blue, Tan, White
Send Chest Measure

WHAT A BUY! Surplus stock from a big midwest supply firm makes these gigantic savings available to you! Sturdy, serviceable work clothes, though used, have been washed, thoroughly sterilized and reconditioned. Every garment made of long-wearing wash materials, strongly sewn, with reinforced stitching at points of strain. When ordering please state measurements under item.

SEND NO MONEY! Just send name, complete address, clothing desired (state how many of each), and your color choice (also 2nd color choice). We will ship immediately. Pay postman plus postage when your order arrives. Or, enclose cash, check or money order, and We Pay Postage. Keep 10 days. Return for full refund of purchase price if not completely satisfied. Order TODAY at our risk!

YOUNG DISTRIBUTING CO. Dept. 23 2605 Elmhurst, Detroit 6, Mich.

Copyrighted material

NEW DISCOVERY HIDES DEAFNESS

CHICAGO (Special)—An amazing new electronic ear which miraculously hides deafness and transmits even whispers with startling clarity, has been revealed by a noted Chicago electronic scientist.

He disclosed that this new discovery enables the deaf to hear without any button showing in the ear.

To acquaint the hard of hearing readers of this magazine with this new electronic ear, full details will be sent in a plain wrapper to anyone who requests it. Address: Electronic Research Director, 1450 W. 19th St., 326-D Beltone Building, Chicago 8, Ill. A penny postcard will do.

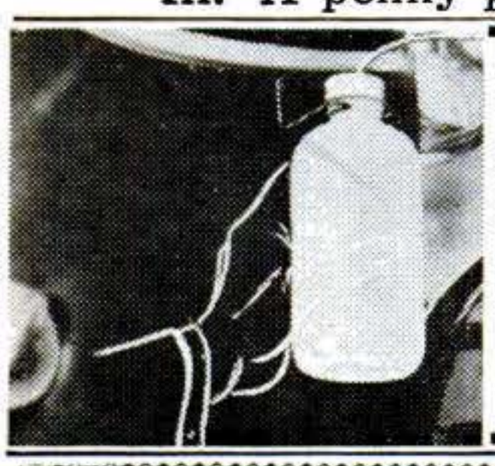
IDEAL LAWNMOWER SHARPENER

Saves work, saves time, helps you earn extra dollars! Sharpens hand, power mowers without disassembling. Complete shop in **one** machine—equipped with Bed Knife Grinder and "lapping-in" Reconditioner. Home owners, parks, clubs, cemeteries pay good money for efficient sharpening; get your share!

WRITE NOW FOR FREE CATALOG

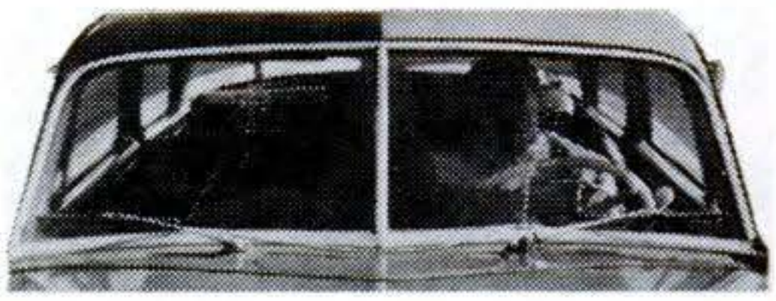
THE FATE-ROOT-HEATH CO., Dept. I-4, Plymouth, Ohio

When Writing to Advertisers Please Mention Popular Science



"SQUEEZE-ME" Windshield Washer

AT LAST—a low-priced windshield washer! Operates by simply squeezing a plastic bottle. Washes both right and left windshields at same time. Fits all cars and trucks. Two-minute installation. No holes to drill. Holds enough water for 100 washes. Can also be used as a solvent dispenser to dissolve ice and snow. Operates as effectively as units costing up to $12.00. At gas stations and auto accessory counters or mailed postpaid . . **$1.25**



DENTON HASSELL Mfg. & Distributing Co., 739 W. 9-Mile Rd., Ferndale 20, Mich.

8MM & 16MM HOME MOVIES

. . . at NEW LOW PRICES!

4 50 Ft. 8MM MOVIES FOR ONLY $4.99

3 100 Ft. 16MM SOUND MOVIES FOR ONLY $9.99

A *ADULT FILMS—for sophisticated grown-up audiences that like a little spice in their movies.

B FAMILY pictures—thrilling reels for the entire family to enjoy.

C CHILDREN'S movies—kids scream with delight at these comedies.

FREE Club Membership

If you want to receive your films on approval—with the right to screen them in your own home before you decide whether or not you want to buy them—join our club—**MEMBERSHIP IS FREE!**

***ADULT FILMS**

Feature Hollywood's most gorgeous girls in exotic song and dance routines.

Paste Coupon on Penny Postcard

MOVIE-OF-THE-MONTH CLUB, Dept. P-11
6507 DE LONGPRE AVENUE, HOLLYWOOD 28, CALIFORNIA

Rush following C.O.D. ☐ 4 8mm films for only $4.99 ☐ 3 16mm SOUND FILMS at $9.99 on MONEY-BACK GUARANTEE. I PREFER ☐ A ☐ B ☐ C

Please enroll me as a member of the MOVIE-of-the-MONTH Club and send me a reel approximately every month postpaid—ON APPROVAL. If I like the reels I will send my remittance within 5 days (enclosing 25¢) without obligation. I may cancel my membership at any time.

NAME_____ Age_____

ADDRESS_____ Zone_____

CITY_____ STATE_____

ADULT FILMS available only to persons over 21 years of age.

Copyrighted material

GUARANTEED FOR LIFE—TO PROTECT A LIFE

SUPPLY LIMITED! ORDER TODAY

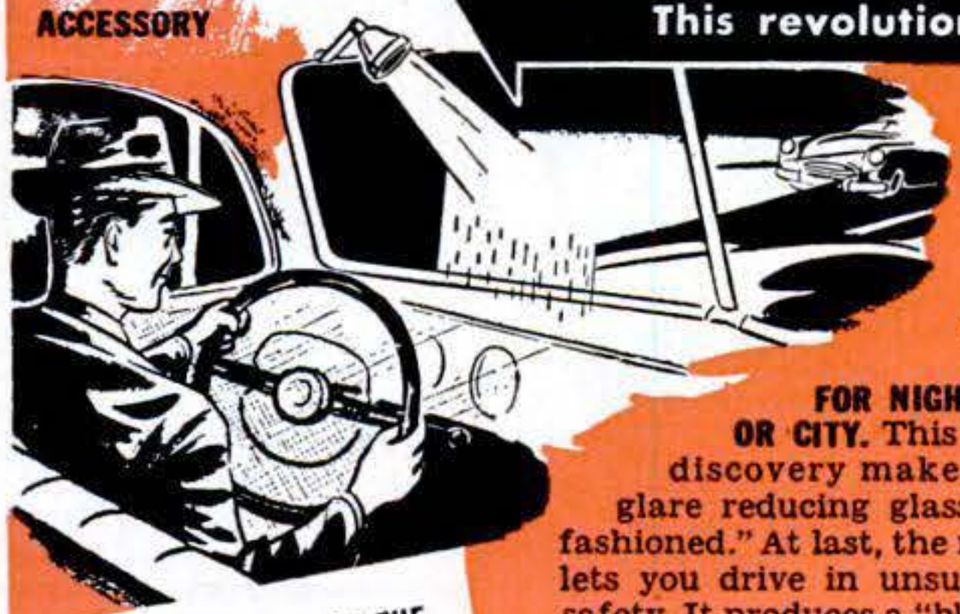
INSTALL IN ONLY 10 MINUTES

Reduce Headlight Glare!

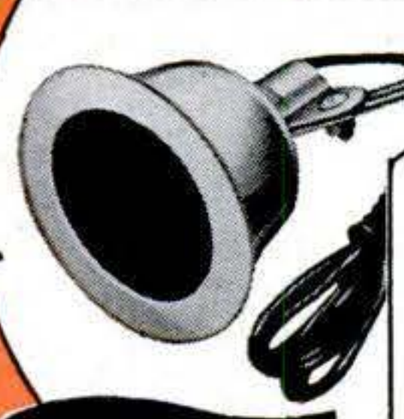
DRIVE IN SAFETY! AND COMFORT!

AMERICA'S MOST WANTED AUTOMOBILE ACCESSORY

With THE AMAZING *NEW* POLARVISION "SAFETY" LIGHT
This revolutionary new discovery—now, at last, available!



EASY TO INSTALL
takes only 10 minutes
FITS ALL CARS AND TRUCKS



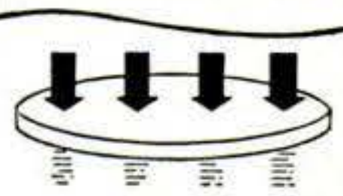
A BEAUTIFUL "rich-looking" ACCESSORY for any car. The light is enclosed in a precision manufactured "air tight" brass alloy case of high grade, heavy duty CHROME PLATE. All inside elements are sealed and guaranteed for life. Adjustable mounting arm is also chrome plated. Mounting screws and ample copper cable wire is included to make installation SIMPLE and EASY.

FOR NIGHT DRIVING IN COUNTRY OR CITY. This sensational new light discovery makes colored visors and glare reducing glasses obsolete and "old fashioned." At last, the new Polarvision Light lets you drive in unsurpassed comfort and safety. It produces a "black light" that shines down on your windshield counteracting the glare from oncoming headlights, street lights, etc. Works like magic—absolutely non-injurious—does not interfere with visibility. The Polarvision Light is the result of years of scientific research and testing of intricate secret light formulas. Works off car's central light circuit and uses very little voltage. **Guaranteed for a lifetime.**

COMPLETE PRICE
$6.95 POST PAID
Dual kit (inc. passenger side mounting) $11.90

READ WHAT ONE OF THE NATION'S TOP ILLUMINATION SCIENTISTS SAYS:

"Regarding the theories involved . . . by adding to any wave lengths of light, such as violet or blue light, we can AND DO create a reflex or sensitizing action." John T. Shannon, Registered Professional Engineer, (California No. 2392, Maryland No. 28) member I.E.S., EMEA, AATC, RIOC, past member AIEE, SAE, SCAS, SMPE.



The Famous "Ergon Glass Lens" is an integral part of the Polarvision Light. Its rare compounded ingredients produce a "BLACK" RAY—barely visible to the eye. This new "black" ray, when added to white "glaring" light, complements and produces a magical polarized effect that relieves eye strain and driving fatigue—a war perfected principle.

FULLY GUARANTEED OR YOUR MONEY BACK BY AIR MAIL

C.O.D. orders—send only $1.00—pay postman $5.95 plus small postage and C.O.D. charge on arrival.

ELECTRONIC DEVELOPMENTS Dept. A10 Box 775, Portland 7, Ore.

A BEAUTIFUL ACCESSORY FOR ANY CAR!

HERE IS THE NEW SENSATION IN LOW-COST TRANSPORTATION

Truly, Cushman EAGLE is the new sensation in its field. It operates for only ¾ ¢ per mile, cruises to 50 m.p.h., gets over 75 miles per gallon. Dealer inquiries invited.

Cushman
EAGLE
WRITE FOR DETAILS AND SPECIFICATIONS
DEPT. 19-S

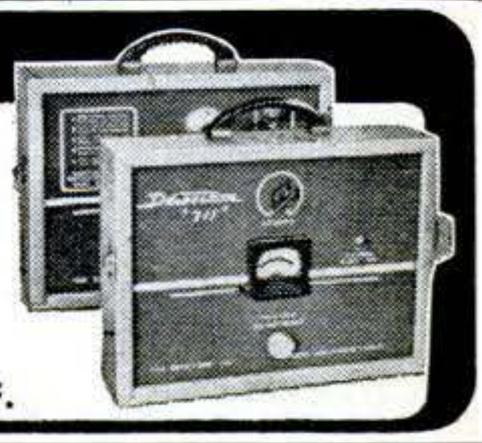
CUSHMAN MOTOR WORKS Lincoln, Nebr.

Detectron GEIGER COUNTERS • TREASURE DETECTORS

LOW COST BATTERIES • LIGHT WEIGHT • 3-WAY SIGNAL • GTD. 1-YEAR

Detectron GEIGER COUNTERS
Sensational new models; low cost operation, light weight, sensitive to all uranium minerals. We have 4 models—one in YOUR price range.

Detectron TREASURE DETECTORS
Lightweight, portable, sensitive. Model 711 (right) is most powerful made. New model 27 for nuggets, rings, small objects. Also mineralights.



Detectron CO.
Write Today for Free Descriptive Literature
5631 CAHUENGA, NORTH HOLLYWOOD, CALIF.

EYE GLASSES BY MAIL

Wide selection helps you choose most becoming styles at reasonable prices.

Now buy latest, most popular creations in modern reading-magnifying glasses from the oldest established U.S. firm offering this service! Thousands of customers coast to coast! We furnish 14-lens sample card with many combinations!

as low as **$1.95**

SEND NO MONEY! 30 DAYS TRIAL!

SEND FOR **FREE catalog**

LATEST STYLE

NAME.....
STREET.....
CITY..... STATE..... DEPT. SP-10

ADVANCE SPECTACLE CO., INC.
537 S. Dearborn Street, Chicago 5, Ill.

Copyrighted material

WAR SURPLUS AND OTHER BARGAINS

AIRCRAFT COCKPIT LAMP ASSEMBLY

6 ft. extension rubber-coated cord, with ratchet locking spool device. A.C. or D.C. current from 6 to 110 Volts. Ideal for home or car use.

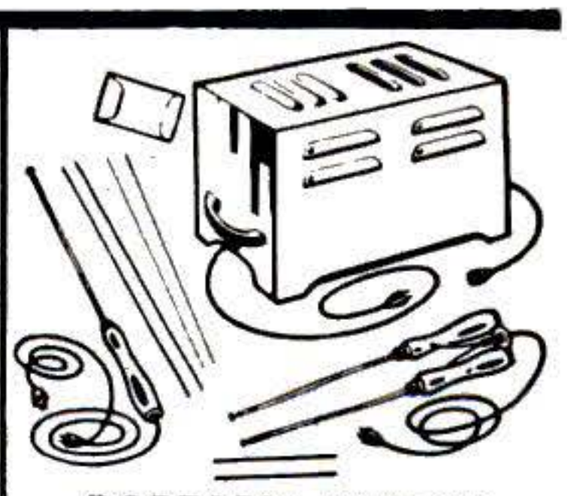
Price **$3.50**

POCKET-PACK PRECISION WRENCHES

First quality chrome-molybdenum steel, heat treated, hardened. Broached to close tolerances. Open end and twelve point box for double use and value. NEW—complete with plastic case—**$1.75** ea. complete. POSTPAID in U.S.A.

LOW VOLTAGE CIRCUIT TESTER

Made for U.S. Ordnance Dept. to rigid specifications. Portable steel hand carrying unit is a self-contained trouble shooting device for making a complete and rapid check of the generator, battery circuit, including any circuit and voltage regulators. Battery voltage, regulators, cut-out settings and generator performance can be easily determined. A terrific testing unit for garages, mechanics, truck fleet owners, boat and marine mechanics. Can be used on any 6 or 12 volt system. Govt. cost approx. $175.00. NEW—complete with book of instructions. **$32.50.** Shipping weight 20 lbs.



PORTABLE WELDER

Will weld, braze, solder and cut all metals up to 3/16". No experience needed, full instructions included. Plug into any 110 Volt A.C. or D.C. line. Complete with electrode and carbon holders, ample supply of electrodes, carbons, flux and all necessary components. Cannot be duplicated for many times its price. NEW—price **$14.95**

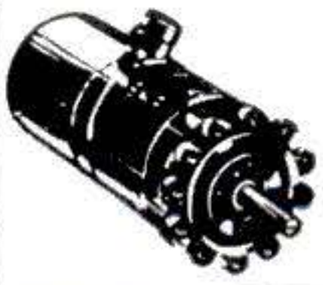
HIGH SPEED DRILLS

All New. Fractional & numbered. Orig. Vol. $15. Nationally known brand. Astd. sizes. Set 30, **$3.50**

SOCKET-PACK WRENCH SET

Chrome-plated alloy steel, heat treated, broached to close tolerances. Reversible ratchet handle, with screwdriver bit on reverse side. Built-in spring-loaded ball retainer on both handle and extension. Clear top plastic kit. 10 piece set—NEW—complete—**$3.75.** POSTPAID in U.S.A.

P.1 GENERATORS



Direct current generators for welders, plating, truck and marine use, D.C. appliances, etc. Aircraft quality, heavy duty. Rating 200 amps—28 volts at 2500 R.P.M. Govt cost $300.00. Weight 70 lbs. NEW—**$21.50**

EXTENSION DRILLS

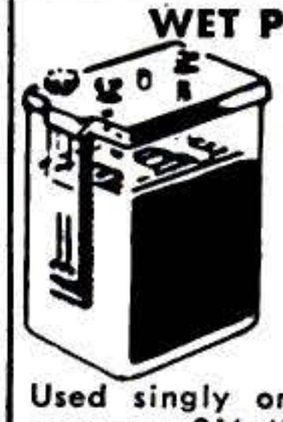
High Speed Steel, like new. Asst'd sizes from No. ¼ to 40. Lengths from 6" to 12". Approximately $20 value. Set of 12 . . . . . **$3.75**

U.S. NAVY HEAT MASK ASSEMBLY

Safety helmet, fiber welder's face shield. Bib and snood of high resistant asbestos, treated with flame proof resin. Govt. cost $50.00. NEW.

Price **$5.95**

WET PLATE BATTERY



Extra long life, rechargeable, ideal for portable radios, mobile units, etc, 2 V. 20 Amps. Only 5" high. Visible ball float hydrometer built in Lucite case. Shipped dry. Used singly or in multiples. Shipping wt. 3½ lbs. NEW **$1.95**

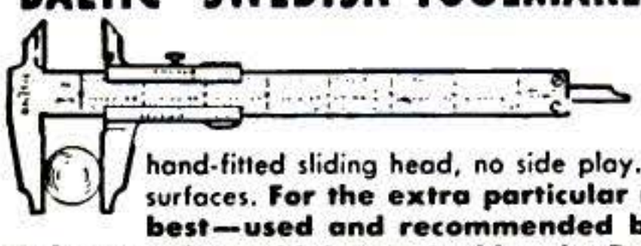
CANNED HEAT

Each can generates enough heat to cook from 3 to 6 meals. 12 cans to the case—6 ea. 2 oz. and 6 ea. 4 oz. NEW—@ **$1.50**

"WRAPLOCK" KITS:

Make your own clamps to fit any size hose tubing etc Kit contains ratchet to take up slack, enough steel band and yokes for 100 or more jobs. New. Weight 4 Lbs **$1** Each complete.

"BALTIC" SWEDISH TOOLMAKERS VERNIER CALIPER



ULTRA PRECISION—0-6" in .001 graduations. Quick, accurate depth, inside and outside measurements, fine engraving. Extra heavy rule, hand-fitted sliding head, no side play. Rockwell C-60, lapped measuring surfaces. **For the extra particular mechanic who must have the best—used and recommended by most critical experimental and research machinists at Lockheed • Douglas • Bendix • GM • RCA • General Electric.** Save 50%! A $37.50 value—only **$17.25**—Leather case incl. Also a standard grade Mauser Design Caliper • made in Germany • For the production machinist, 0-6" in thousandths, the most accurate caliper of this type on the market, thousands of satisfied users—only **$12.95**—Leather case included.

These are both guaranteed buys. Your money back if not entirely satisfied Order now!

DRILL GRINDER

All New. **$2.80** each.

. . . Sharpens round, square or tapered drills up to 6" long. Even an amateur mechanic can get a new, factory finish on a drill in 25 seconds. New protractor feature gives every drill sharpening angle, with 5 convenient angles already marked off. Usable with hand or power stone. A brand new development, manufactured by Ten Eyck. Shipped postpaid

FLEXIBLE SHAFT MAGNET

Strong ALNICO V Magnet on 18" flexible shaft. The shaft is Cadmium Plated.

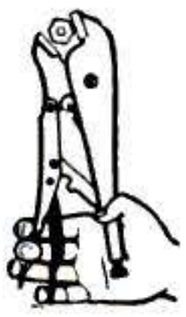
For picking up cotter pins, nuts, wrenches, etc., from inaccessible places. Removes Bobbie Pins, etc., from drains. Lifetime Magnetism Guarantee. Highly polished magnet and handle. **$1.70** postpaid

MICROSCOPE 100 and 150 POWER

A fine precision instrument ...not a toy. Highly ground and polished lenses. Overall height 8½ inches. Designed for easy portability and yet stable enough for laboratory use. Microscope, leather case for barrel, four slides and carrying case

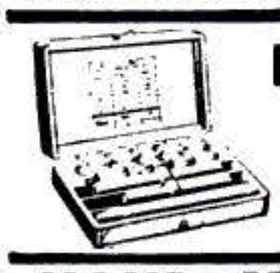
$9.95 postpaid.

K-VISE SAFETY LOCK WRENCH



Has 1 ton tested non-slip grip, cad-plated A flip of the finger releases a 1 ton pressure. 10 inch size. Price **$2.50**

RIVET SETS

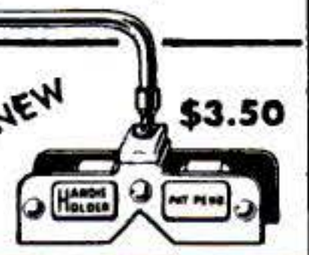


Universal type, case hardened tips. Set of dies will head up any brazier or round head rivet from 1/16" to ¼" With adapters for air gun or hand use. All new . cost Government about $27.00 Complete 15 piece set, wt, 2 lbs., **$5.00**

MAGNETIC BASE INDICATOR HOLDER

Available with adapter bushings for all types dial indicators, with guaranteed lifetime Alnico magnets. Vee-slotted base has 45 to 50 lbs. pull without special attachments.

NEW **$3.50**



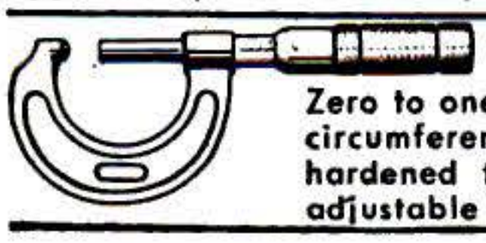
HAND MITRE

"It pays its way in just one day!"

It's sensational! New HAND MITRE saves hundreds of hours . requires only a "flick" of the hand for a precision mitre every time. The HAND MITRE will cut any desired angle. Its rugged construction will handle hard and soft wood mouldings, plastic trim, base shoe, laminated materials, rubber extrusions, etc Made of heavy gauge stainless steel

$3.95 postpaid

CENTRAL TUBULAR MICROMETER



Zero to one inch. Made for U.S Air Force. Measures circumferences and cylindrical wall thicknesses. Case hardened tips. NEW—**$5.50** Each—complete with adjustable spanner wrench.

Send check, money order or cash. 25% deposit required on C.O.D. orders. All prices F.O.B. Culver City, California, unless otherwise stated.

Send 25c for New *1951* Illustrated Catalog.

AIRBORNE SALES CO., INC. DEPT PSM 10-51 CULVER CITY, CALIF

Copyrighted material

Classified Ads only 80c per word per insertion, payable in advance. Minimum ad 10 words. To be included in December issue, copy should be in our office by October 23. No cancellations accepted after October 15.

CLASSIFIED OPPORTUNITIES

POPULAR SCIENCE MONTHLY-351 FOURTH AVE.-NEW YORK CITY 10

1 AUTOMOBILES & MIDGET CARS

CLYMER Books—New Titles. Catalog All 1951 U. S. Cars, photographs, specifications, technical data, compares all makes in one book $2.00—Catalog all 1951 British Cars $2.00—Catalog all 1951 British Motorcycles $2.00—Reprint latest Duesenberg Instruction Book $1.50—The Modern Chassis $2.00—Sports Car Engine $1.50—New York to Paris 1908 Race Book $1.50—1951 Indianapolis Official Yearbook $1.50—Souping the Stock Engine $2.00—British Car Owners Handbook of Maintenance $2.00—Specials and Hot Rods $1.50. All Postpaid. Catalog 75 Motorbooks Free. B. Clymer, 1268 S. Alvarado. Los Angeles 6. Calif.

"WATER Injection." Also—Economy—Power—Methods. Free illustrated information. Neher Industries. La Verne 6. Calif.

CATERPILLAR Junior Crawler Tractor —Electric Power Driven—Licensed by Caterpillar Tractor Company. Finest practical child's vehicle in America. Rugged Full-Track for driving over lawns, fields or hard surfaces. Junior model of Caterpillar D-4 Diesel . . . for all children four to ten years old. Special at $74.50. Foot-pedal model $39.95. Freight paid in U. S. A. . . . Most sensational child's vehicle in the country! Satisfaction guaranteed! Order or send for free literature. Mystic River Sales Co., Box 312G. Mystic. Conn.

BIGGEST "Speed Equipment Catalog" in world! Save, order direct—Hollywood Mufflers, $4.95, Dual Mufflers, $18.95, Cut Outs $6.95, Dual Intake Manifolds $12.95, Racing Cams $29, Hi-Compression Heads $26.95, Water Injectors $6.95, Customizing Kits $1.98. Chrome Accessories at discounts! (Free "Hot Rod Handbook" included)—25c. Almquist Engineering, Milford 43Z. Penna. (Dealers Wanted.)

"S-P-E-E-D & Mileage" Manual—Easily get lightning acceleration—up to 100% power and mileage increases from any car! Famous Soup-Up Book shows how to build Speed Equipment, Racers, Fast Conversions, Stock Cars, California Roadsters! Covers "Souping", Speed Tuning, Racing Tricks, Fuel Formulas, Economy Information, Indianapolis Methods, "Customizing" —All cars! 300 Photographs! Drawings! "Restyling Plans!"—Complete with "Hot Rod Builders Book" $1.98. Almquist Engineering, Milford 41Z. Penna.

BUY racing heads, dual manifolds, Hot coils, etc. without money. Information free. Newhouse Automotive Industries, Los Angeles 22.

HERE It Is! The buy of a lifetime for any Car Owner, Dealer or Mechanic! "Automobile Engineering," a huge, 4-volume set totaling 2,804 pages, compiled by 11 foremost automotive engineers, published by a famous publisher and covering all phases of car design, operation, servicing and repair! Packed with basic information, photos, diagrams, charts, this encyclopedia of car knowledge stands half a foot wide on your bookshelf. It will be your ultimate authority on clutches, brakes, pistons, axles, fuel systems, wiring diagrams, 1,001 engine kinks, plus all other parts in all leading models! This immense, 4-volume treasury of money-saving facts retails at $24.80 a set. By special publisher's agreement, Popular Science can offer you the same set at fantastic bargain price of only $9.98! Just a few sets available, so act at once. Rush only $9.98 for the best buy in books ever! Popular Science Monthly, Dept. 1051-C, 353-4th Avenue, New York 10, N. Y.

SAVE—California Custom Accessories headquarters. Buy direct from original designers. Chrome dash panels, electric push button door-trunk conversions, fender skirts, dual mufflers, lowering kits, speed-dress up equipment. 40 page catalog. Hundreds of photos—25c. Eastern Auto, 3319D South Grand, Los Angeles 7, Calif.

MOTORISTS—Save gas with proven automatic alcohol-water injector! Only $5.95! Free literature. Vaporizer Company, Box 7033N. Los Angeles 37, California.

NEWHOUSE makes another sensational offer. See page 46. Don't miss it.

MAKE Ford use Diesel fuel $1.00 for plans. Refiner, Box 292, Columbus, Nebr.

FOR as little as $8.00 you can put your ad here in the December issue. Get in on the Christmas mail-order rush and deliver your sales talk direct to the 3,992,000 readers of Popular Science. Special classification "Christmas Gifts"—available for this issue. Same low rate you've always paid—80c a word. The December issue closes on October 25th! Write today for order blank and free booklet, "How To Make Money Out of Classified Advertising." O. K. Kelly, Classified Advertising Manager, Popular Science Monthly, Dept. B, 353 Fourth Avenue, New York 10, New York.

2 AUTO SUPPLIES & EQUIPMENT

NEW and used guaranteed parts for civilian and Army cars and trucks. Largest stock in America. Mail orders. Pioneer Auto Wrecking Company, 788 W. 13th Avenue, Denver, Colorado.

FROM Speedway to Roadway! Track-proved hi-speed heads, manifolds now available for any passenger car! No special tools needed! Increase horsepower 25%! Astounding getaway! Free illustrated catalog. Speedsport, 6215-F Diversey, Chicago 39.

BRUSH Plating Outfits connect to a battery. No tanks or shop required. Free particulars. Gunmetal Co., Avenue K, Decatur, Illinois.

FOR free descriptive literature on alcohol-water injection for cars—trucks—tractors write Shade, Webster, New York.

1951 EDITION. It's new. It's Different! Get world's largest Auto Accessory & Parts Catalog and save money. Over 50,000 items, including Hollywood Accessories, Hi-Speed Equipment, Rebuilt Engines, all parts and accessories for all cars and trucks. We have that Hard-To-Get part! Jam packed with bargains. Completely illustrated. Send 25c (refundable). J. C. Whitney, 1919-T Archer, Chicago 16.

HI-SPEED equipment accessories—free booklet. Leo's Auto Supply, Tucson, Ariz.

INCREASE! Gasoline mileage three to five miles gallon. Improved vaporizer; increases power; easier starting $3.50 each. Turb-O-Vane, Box 1167, Stockton, Calif.

YES, it puts babbitt type bearings on the pistons for 100,000 miles. For $3.00 postpaid, Lachapelle's treatment. Ferns Products, 8120-D Walnut Drive, Los Angeles 1, Calif. (Data on request.)

MOTORIST save gasoline by Vacu-mating overrich mixtures. Fits all cars. For Free particulars write Vacumatic, Dept. 1797, Wauwatosa, Wisconsin.

CRASHPROOF your car. Rusco Airplane Safety Belts now available for passenger-car installation. Russell Manufacturing Company, P.O. Box 1001, Middletown, Conn.

FREE Catalog accessories. Air Horns. Send postcard. Bill McCanna, 148-A East 40th, New York 16.

CHEVROLET owners replace your own connecting rods in one hour save $. New tool price $2.65. H. R. Harman Tool Works, Vernon, Michigan.

SEND for free Life Membership Card. "Water Burners" of America, La Verne, California.

WILL buy a Stanley Steamer engine. 4x5 or 4½x6½. Howard Cyphers, R. 1, Box 313, Central Point, Ore.

MOTORISTS—Restore motor compression, save "burned oil" dollars with engineered product. Only $3.95. Free folder. Advanced Engineering, Box 7013F, Los Angeles 37, California.

REVOLUTIONARY method, developed for jet engines, easily locates fatigue cracks, other defects, in gears, pistons, castings, all metals. Garage-Welding-Machinists Kit $4. Distributors wanted. Met-L-Chek, Hawthorne, Calif.

SUN Visor for your car . . . only $1.95. See ad on Pg. 87. Young Products, 2605 Elmhurst, Detroit 6, Mich.

RACING & Hot Rod Equipment at Nation's Lowest Prices—Free Power Handbook with Catalog—25c. Almquist Engineering, Milford 45Z, Penna. (Dealers Wanted.)

"HOW to buy speed equipment without money." No selling. Information free. Newhouse Automotive Industries, Los Angeles 22.

KEY case and tire gauge combination—retails $1.00. Discounts to salesmen—dealers send $1.00 for sample. Box 2692, Lakewood 7, Ohio.

FOR as little as $8.00 you can put your ad here in the December issue. Get in on the Christmas mail-order rush and deliver your sales talk direct to the 3,992,000 readers of Popular Science. Special classification "Christmas Gifts"—available for this issue. Same low rate you've always paid—80c a word. The December issue closes on October 25th! Write today for order blank and free booklet, "How To Make Money Out of Classified Advertising." O. K. Kelly, Classified Advertising Manager, Popular Science Monthly, Dept. B, 353 Fourth Avenue, New York 10, New York.

3 AUTO TRAILERS

BUILD your own trailer! Plans for all kinds. Illustrated catalog 10c. Jim Dandy, 125-S. Wausau, Wisconsin.

4 MOTORCYCLES, BICYCLES AND SUPPLIES

RECONDITIONED motorcycles and motors. Chromium accessories. Complete stock Indian parts. Expert rebuilding. Fast service. Indian Motorcycle Sales, Kansas City 1, Mo.

MIDGET Car $10. Motorbike $7. Satetycycle, $15 less engines; Whizzer motor $6; Smith motorwheel $10; Evinrude outboard motor $8. Four airplane type tires $3 (mailorder only). Send 25c for new catalogue Number 43, just out listing these and hundreds of other bargains in new and used midget cars, motorscooters, homebuilders parts, plans, engines, transmissions, war surplus, etc. (35c by First Class Mail.) Midget Motors Directory, Athens, O.

CLYMER Motorcycle Books. Catalogue all 1951 British Motorcycles with photographs and specifications $2.00—The Motorcyclist's Workshop $1.50—American Motorcycle Service Manual all U. S. Makes Questions, Answers $2.00—How to Obtain Speed $1.50. All Postpaid. Catalogue 75 Motorbooks free. B. Clymer, 1268 S. Alvarado, Los Angeles 6, Calif.

MOTORCYCLE Magazine — Worldwide Coverage. Yearly Subscription $2.00. Sample 20c. Motorcycle News, 5424-B Sawyer, Chicago 25.

WHIZZER, all attachments, $20; Cushman motorscooter $20; Indian motorcycle $30; engines $3 up; motorbike frame $3. Rush 25c (35c first class mail) for catalog #949 listing many other amazing bargains in motors, midget cars, motorscooters, motorbikes, etc. Associated, Box 1764-CS, Toledo, Ohio.

WHIZZER in Schwinn bike $20; good motorscooter (twist grips) $22.50; midget car $15; Shaw bicycle motor $15. Send 25c (35c first class mail) for catalog #19 jammed with other sensational bargains in wheels, motors, clutches, motorscooters, midget cars, motorettes, motorbikes, etc. Gail, 538 Erie, Toledo, Ohio.

REBUILT Gasoline Engines. $17.00 to $37.00. Cauffiel Motor Industries, Temperance, Michigan.

Copyrighted material

POPULAR SCIENCE OPPORTUNITIES

5 AVIATION

FREE 168 page illustrated catalogue of aviation products. Complete bonded warehouse stocks, write AMC Supply, P. O. Box 1440-S, Fort Worth, Texas.

HELICOPTER, build from spare parts or kit. Catalog and blueprints, $5.00. No model. Aero-Tech, 601 Jefferson Street, Montgomery, Alabama.

BULLET Raceplane. Homebuilt. Speedy Monoplane. Blueprints $2.00. Corbcraft, 80-S Elmerston, Rochester, N. Y.

PROPELLERS, plans, supplies for snow sleighs, air boats. Catalog 20c. Banks-Maxwell, Box 3301G, Ft. Worth, Texas.

LIGHTPLANES—Practical Design. Blueprint form. $2.50. Thompson Aircraft, Box 684, Prosser, Washington.

7 ELECTRICAL SUPPLIES & EQUIPMENT

LAMPS—Build own Originals. Parts Wholesale, any amounts. Catalogue 10c. Brown Lamp Co., No. 501 Wellston, St. Louis 12, Mo.

LAMPS—Had trouble finding repair parts? Your search is ended. 25c brings 64 page illustrated catalog containing wiring charts. Gyro Lamps, 5402B Clark, Chicago 40, Illinois.

8 WELDING, SOLDERING

A.C. Welders. 4 Sizes. Lowest Prices. Free literature. Holgerson's Service, Canton, Kansas.

9 MACHINERY, TOOL SUPPLIES, ETC.

FREE Catalog. Full line hobby and light industrial power wood working tools. Guaranteed. Dealers wanted. Backus Machine Co., Chippewa Falls, Wisconsin.

NEWS! For saw shops using Foley Filers. Write for particulars. Stadick Mfg. Co., New Ulm, Minnesota.

BIG Dollar Value—Five Assorted lifetime screwdrivers. Amber Handles. Shock proof. Factory surplus. Stocks limited. Worth triple. $1.00 postpaid. Sax-on, Dept. N-4, 3840 Fullerton, Chicago 47.

POWER tools, equipment wholesale prices. Free Bulletin. Homecrafters Co-operative, Grand Rapids 6, Michigan.

TIGER Tractor, America's Finest 6 HP riding tractor. Pulls 4 tons. 10 inch plow —All big tractor features. Free literature. Tiger Tractor, 70 East St. Keyser, W. Va.

CIRCLE Cut Attachment—for 14" delta —cut circle and out tangent—$5.00 postpaid. A. W. Gibbons, 3632 Chelton Road, Shaker Heights 20, Ohio.

MACHINE Shop Men and Handy Men! Save over 60% on the most authoritative set of home-instruction books ever published anywhere on machine shop practice . . . The Modern Shop Practice Library. The famous publishers issued this magnificent 8-Volume set for which thousands eagerly paid $34.80! Now Popular Science makes the very same library yours for only $11.98! Contains world's most complete coverage of machine shop knowledge. Over 4,000 pages of vital information, 3,848 detailed illustrations, plus 167 tables! Written simply, clearly by 41 of nation's top-ranking experts. All you need to know about tool making, pattern making, foundry work, forging, mechanical drawing, blueprint reading, and hundreds of other skills. Each skill worth the price of the set alone! Each volume indexed. Beautiful, lifetime bindings. Never before in U. S. history has there been such a need for skilled machine shop men. You can make more money by claiming Your complete 14 lb. "Modern Shop Practice Library" now! You run no risk . . . money back if not fully delighted. Remember, you pay—not the $34.80 paid by thousands of satisfied men, but the low price of just $11.98. Send remittance and order Today to Dept. 1051-C, Popular Science, 353-4th Ave., New York 10, N. Y.

SPECIALS!! Send $1.00 for full value Credit Certificate and receive monthly catalog mailing. Hardware, Power Tools, Paint, Supplies. Save dollars! Many items priced less than wholesale! Satisfaction guaranteed! American Hardware, 412 North Irving, Minneapolis 5, Minn.

10 ENGINES, MOTORS, ETC.

WINDING Data, listing 225 motors, single and three phase. $1.00. Motor Data. Box 7631, Kansas City 3, Mo.

HOTTEST surplus list in the country. Electronics, Hydraulics, Aircraft, Gadgets. Dick Rose, Everett, Washington.

REBUILT Gasoline Engines. $17.00 to $37.00. Cauffiel Motor Industries, Temperance, Michigan.

MOTOR Winders, free bulletins. Winding and testing equipment. Motor Industries, Quincy, Illinois.

EARN Big Money! Become an expert in Diesel Engineering. Think of it, you can now claim The Complete Diesel Engineering Library through a special Popular Science offer that knocks off 62% of the original cost! Thousands eagerly paid $29.80 for this magnificent 6-Volume Set, the most complete library of its kind. You get it for only $9.98! Over 30 Diesel experts and top-ranking technicians pooled their high-paid knowledge and experience to create the world's most exhaustive library on Diesel engineering. Here's your complete treasury of fact and illustration on the Construction, Operation and Maintenance of Heavy-Duty and High-Speed Diesel Engines. You get all allied instruction in amazingly easy-to-follow style . . . practical mathematics, slide rule, principles of electricity, construction, operation and maintenance of motors, Diesel electric plants, mechanical and electrical equipment for Diesel locomotives; thermodynamics, theory and design of Diesel engines and a great deal more. Profusely illustrated, jammed with tables, charts, show-how diagrams. Each volume sturdily bound, fully indexed. Start up the road to higher earnings Today. Claim your Diesel Engineering Library Today, remit not $29.80, but only $9.98 to Dept. 1051, Popular Science, 353-4th Avenue, New York 10, N.Y.

11 BOATS, OUTBOARD MOTORS

STEERING Wheels, windshield brackets, from $6.95. Modern fittings "Water Skis," at lowest prices. Complete pre-cut plywood boats. Bargains galore. Folder 10c. Marine, Box 681, Mendota, Minnesota.

FASTEST Boats In The World—Build Now. Complete plans available for sleek Three Point Racing Hydroplanes. Runabout and others. Send 25c now for new illustrated catalogue. Champion Boats, Box 9038, Dept. 23-J, Long Beach, Calif.

NEW, used, rebuilt marine motors. Marine conversions, fittings. Free Catalog. Stokes Marine Supply, Dept. 23, Coldwater, Mich.

FULL size, cut to shape boat patterns, blueprints, 7½-38 feet. Illustrated "Build a Boat" catalog 25c (coin). "How to Build Boats" book, $1.00. Cleveland Boat Blueprint Co., Dept. A-77, Cleveland 13, Ohio.

OUTBOARD Motor Parts—New—Used for all makes. Send stamp for price quotation. Outboard Motor Mart, Inc., 309D Atlantic Ave., Boston 10, Mass.

SAVE 2/3 cost. Assemble your own boat. We furnish parts. No experience necessary. Rowboats, Cruisers. Illustrated Catalog 25c. Midwest Boat Company, Menomonee Falls 1, Wisconsin.

MARINE conversions for Ford and Jeep engines. Catalog 10c. Lehman Manufacturing Co., 972A Broad St., Newark 2, N. J.

12 BODY-BUILDING COURSES, JIU JITSU & ATHLETIC EQUIPMENT

DEADLY Judo—Fiercest fighting technique. Trick knockouts. (Over 200 illustrated pictures.) Expert instructions—Three volumes Complete $2.25. Variety House, Box 46-A Wall Station, New York 5.

EXERCISE With Fist To Fist. Punch O Bag. 1817 S. 60 Ct., Cicero, Illinois.

SUPER Jiu Jitsu Course. Two mammoth volumes. New. (regular—$4.95) Sellout—98c. Midwestern Distributors, Revelstoke, B. C., Canada.

BARBELLS, Dumbbells. Exercise equipment. Courses. Free booklet. Good Barbell Co., Reading, Penna.

HANDBALANCING self-taught. Learn television stunts. Write. Power, 923 W. Vine, Kalamazoo, Michigan.

14 FIELD GLASSES, TELESCOPES

"FREE" Catalogue! Thousand war surplus optical bargains. Lenses, Prisms, Telescopes, Binoculars, etc. Send $1.00 for 10 Lens Hobbyist Set and Project booklet. G. Jaegers, 93-08—95th Avenue, Ozone Park 16, N. Y.

BIGGER and better telescope kits with metal parts direct from manufacturer. Free Bulletins. Esco Products, 911 Willow Ave., Hoboken, New Jersey.

GIANT, 100 power astronomical telescope with 6 ft. tripod (10,000 area magnification) Clear Vision full power guaranteed. $15.00 F. O. B. factory. Suffolk Science Services, Dept. TC, Riverhead, N. Y.

SAVE 50% On New Binoculars! Free Catalog. Free book, "How to Select Binoculars." Write today! Bushnell's, 43-P30 Green, Pasadena 1, California.

WAR Surplus Bargains. Binoculars, Telescopes, Sextants, Millions of Lenses, Prisms, Reticles, Eyepieces, Objectives, etc. Mail 10c for Big "Catalog CN." Send $1.00 for Stock CN-10-piece Lens Kit and Big Instruction Booklet. Edmund Scientific Corp. (Formerly Edmund Salvage Co.) Barrington, New Jersey.

BINOCULARS, telescopes, microscopes. Our 20th year of leadership in optical values. Bargain catalog free. Brownscope Co., 24 West 45th St., New York.

AMAZING prices, brand new precision binoculars, $16.00 up. Free trial. Folder "Binocular Selecting," pricelist free. Prentiss Importers, Mercury Bldg., West Los Angeles 25, Calif.

FREE 20-page Binocular Catalog. Over 60 different models. United. Dept. ARF-4716, 9043 S. Western, Chicago 20.

ONE 6" refractor telescope with finderscope, revolving eyepieces 35-75-300 power. Esco Products, 911 Willow Ave., Hoboken, New Jersey.

REFLECTING Telescopes, completely assembled, 60X, $25.00. Guaranteed Observatory clearness. Free information. Skyscope, 475 Fifth Avenue, New York 17.

ASTRONOMICAL Telescopes, binoculars, microscopes; bought, sold, repaired. Books, lists 10c. Rasmussen-Reece, Amsterdam, N.Y.

BINOCULAR Specialists, all makes repaired. Authorized Zeiss, Hensoldt dealer. Tele-Optics, 5514 Lawrence, Chicago 30, Illinois.

BINOCULARS completely repaired. Send glasses or write for estimate. Gould Lens Service, 26P Franklin Ave., Binghamton, New York.

ALUMINIZED Telescope mirrors 3"-8" diameters. Eyepieces—Prisms—Tubing. 50-400x Astronomical telescope lens kit $3.00. 300x pocket microscope $1.00. Postcard brings plans—literature. Pfleegor Optical Co., PS-10, Sunbury, Penna.

POWERFUL astronomical telescopes easily made. Perfect lenses and instructions; 100x $3.00; 100x and 200x $4.00; 100x, 200x and 400x $6.00. Full power, clear vision guaranteed. Instructions alone 10c. Suffolk Science Service, Riverhead, N. Y.

FOR as little as $8.00 you can put your ad here in the December issue. Get in on the Christmas mail-order rush and deliver your sales talk direct to the 3,992,000 readers of Popular Science. Special classification "Christmas Gifts"—available for this issue. Same low rate you've always paid—80c a word. The December issue closes on October 25th! Write today for order blank and free booklet, "How To Make Money Out of Classified Advertising." O. K. Kelly, Classified Advertising Manager, Popular Science Monthly, Dept. B, 353 Fourth Avenue, New York 10, New York.

Copyrighted material

15 SPORTING GOODS, GUNS, FISHING TACKLE, ARCHERY, TRAPPING

190 PROFUSELY illustrated pages antique and modern pistols, swords, daggers, armor, etc. 50c. Robert Abels, PS860 Lexington Ave., New York 21.

CAST Iron Molds—for making your own sinkers. Write for free illustrated booklet. Reading Instrument Co., Box 78, Reading, Pennsylvania.

LEARN Gunsmithing! Details, copy "Guns and Gunsmithing." 25c. Gunsmith's Service, 3118 Montrose, Chicago 18, Ill.

CALLS, records, and decoys for duck, crow and goose hunters. Free catalog. Oscar Quam, 3149-39 Avenue South, Minneapolis, Minn.

ANTIQUE Firearms, accessories and parts. Illustrated lists for year $1. Weisz, 100 South Uhle Street, Arlington 4, Va.

AMMUNITION. American-Foreign and Obsolete. New guns. Dime for list. Central Sports, Delphos 25, Ohio.

5,000 BARGAINS, firearms, binoculars, war relics, catalog 50c. Smith Museum, Runnemede, N. J.

MOLDS "For fishermen, sinker, squids, jigs, and lures" handled and hinged, quality fishing tackle, free catalogue. Sweets Molds, Tonawanda, New York, Box 163.

SEND 10c for lists either rifles, handguns, shotguns, ammunition. Or send 25c for all lists. Frayseth's, Willmar, Minn.

AMMUNITION 9 Luger $2.40, 30/06 $2.00, 8 Mauser $1.90, Jap $2.50, Italian $2.50. Send 10c complete list—100 kinds. Telescopes $5.00, microscopes, rifles, pistols, crossbows. Ashton Company, 1511 Gardner, Hollywood 48, Calif.

OVER 500 guns, modern, obsolete. List 10c coin. Ed Howe, 26 main, Coopers Mills, Maine.

SPORTSMEN, after the days hunt, or when you're tired fishing do something you have always wanted to do. Do some prospecting. My detailed bulletin is strictly for the amateur. Contains nothing technical. Money back guarantee. Send $1.00 to James Black, Box 203-A, La Honda, Cal.

ATTENTION Hunters—Farmers—Shooters. Over 100 excellent deer-varmint rifles from $27.50. List $.25—Agramonte, Dept. SM, 201 Warburton, Yonkers 2A, N. Y.

200 CALIBERS ammunition. New guns. Catalogue 25c. Sloper's, Holbrook, Arizona.

SCOPES, mounts, guns, KV new $42.00. All makes free list. Ted Challingsworth, Golden, Colorado.

17 DOGS, BIRDS, HAMSTERS, & PETS

SEE Gulf Hamstery ad on Page 42. Shows picture of Hamster.

EARN Up To $400 Monthly Raising Angora or New Zealand Rabbits. Plenty markets. Particulars free. White's Rabbitry, Newark 35, Ohio.

MAKE Big Money! Raise Chinchilla Rabbits. Cash Markets Supplied. Write Today! Rockhill Ranch, Sellersville 16, Pa.

NATURALIST'S Catalog 10c. Chameleon 50c. Hamsters $2.75 pair. Turtle 50c. Mexican Jumping Beans 25 for 75c. Quivira Specialties, Topeka 10, Kansas.

RAISE Mink: Free booklet, pen plans, inside "secrets" feed care. Mink are money makers. Investigate today. Lawrence Molgard, Brigham City 13, Utah.

BLOODHOUND pups for hunting or man trailing. Walter Bixler, Peru, Indiana.

THE New Panda Hamster, write for price and details. Fred Battersby, 430 N. 4th St., Vineland, New Jersey.

RAISE Guinea Pigs. Markets guaranteed. Booklet free. Taylors, B426B, Hapeville, Ga.

ST. Bernards, Newfoundlands, Grown—puppies. Persian Kitten. Stamps please. Phone 2-4848, Michigan City, Ind., R. 3.

HAMSTERS moneymakers. Send $5.00 for beautiful virgin pair, cage, and illustrated instructions. Free prices. Dixie Hamstery, 502-D Trinity Lane, Nashville 7, Tenn.

LOVELY golden cream Great Dane puppies—Loving companion, —Guard, 36 West 1st No. St., Salt Lake City, Utah.

18 FROG RAISING

AVAILABLE for delivery. Famous Lee Domesticated Bullfrog breeders, $18.00 per pr. Yearlings $12.00 per doz. F.O.B. Instructions on care & feeding of these frogs. Live delivery guaranteed. Send check or Money order. Lee's Frog Hatchery, Box 24, Casitas Springs, Calif.

19 FARMS, OTHER REAL ESTATE

GOOD Farms—Ranches, Washington, Minnesota, Montana, Idaho, Oregon, North Dakota. Dependable Crops, favorable climate. Write for literature, lists describing typical farm opportunities. Specify which state. J. W. Haw, 120 Northern Pacific Ry., St. Paul 1, Minnesota.

OZARK Lands for all purposes. Actual river frontages. 5 acres $90.00 and upwards. Free list and literature. Hubbard, 424-H, Minnesota Ave., Kansas City 1, Kan.

BIG Free Fall Catalog! Farm and country real estate bargains, good pictures, many states, easy terms, many equipped, businesses. For Special Service, state requirements, desired location. United Farm Agency, 2825-PS Main St., Kansas City 8, Missouri.

NEW Farm & Business Catalog Free! Just out! Maine to Florida . . . Bargains from $1,000 . . . up! West's, 8-G, Pittsburgh 17, Penna.

FLORIDA Homesites—$145. Pay $10 monthly. Large, beautifully wooded Tracts, high and dry, in delightful Panama City Pleasure Resort Area. World's finest Beaches. Lovely Lakes. Best fishing, hunting. Enjoy life every day in this glorious climate and desirable Community. Low taxes—low building costs—low living costs make this ideal Place for your Vacation Lodge or Retirement Home. You get Most for Your money here. Booklet Free. Douglas Wood, Box 873, Houston, Texas.

STROUT'S New Fall Catalog just out! East and Mid-West Red cover; West Coast edition Blue. Farms, Homes, Businesses, bargains galore. Either Mailed Free. Strout Realty, 255-ZB 4th Ave., New York 10, N.Y.

FLORIDA. New Lake County development adjoining Ocala National Forest. Best fishing, hunting. Safe from bombs. Nice homesites $245 at $10 monthly. Folder free. Winfree Vernor, DeLand, Florida.

BEAUTIFUL Home in Hana, Maui, Hawaii. $4800. Write, Harold Ashworth.

21 POULTRY & SUPPLIES

RAISE pheasants on the $100 week plan. Little capital and space can make you independent. Free details. Great Central Game Management System, Columbus 6, Kansas.

22 PROFITABLE OCCUPATIONS

BE independent, be secure, have your own profitable business—earn $20.00 and more a day making beautiful, fast-selling lamps at home. No equipment needed. Illustrated course teaches you quickly. Course, parts catalog, wholesale price list —only $2. Gearon Co., Dept. 200-A10, 27 S. Desplaines, Chicago 6, Ill.

FREE book "How to Make Money With Home Workshop" describes amazing methods used by hundreds of successful craftsmen. Tells what to make. How to sell workshop output spare time. Write at once for details. Remember it's free! Craftsman, 115-B10 Worth St., New York City.

DETECTIVES Earn Big Money. Excellent opportunity. Detective Particulars free. Write, Wagoner, P-125 West 86th, New York 24.

$5000 FROM half acre growing Ginseng, crop bought. Particulars 10c. Associated Growers, Sperling, Manitoba.

$40.00 WEEKLY. Made growing mushrooms. Fresh. Dried. Dominion Patent 331,583, free spawn. North American, 169Y Yonge, Toronto, Canada.

PRINT without a printing press! Big Profits! See page 61.

LEARN Watch-Clock Repairing at home. While learning we fix all watches for you. Inquire Modern Technical Supply Co., 55-PS West 42 Street, New York 18, N. Y.

PROFITABLE spare time business, operate home mailing bureau, full instructions 25c. Allen Industries, 219-D Wright St., Shepherd, Mich.

FINISH 6" maple salad bowls for profit. Sanded bowls at $6.72 per doz. Lacquer 50c pint. Retail $1.00 each. Ottawa Woodcraft, Grand Haven, Michigan.

WANT a Diesel Job? Our approved, up-to-the-minute Diesel Training Program can help you qualify for steady, big pay jobs or specialized military training. Covers Diesel, Tractor, Heavy Equipment. Easy to master. No loss of present income. Job Placement Advisory Service. Investigate! Write for information today. Interstate Training Service, Dept. 2K, Portland 13, Oregon.

MUSHROOMS Grown. Boxes, barrels, instructions 50c. Spawn $1.00. Manureless process. $2.00. Gordens, 328 Bannerman, Winnipeg, Manitoba.

ANIMAL Lovers! Make money with animals. Send $1.00 for details and instructions. 110 Practical ideas explained. Animal Lovers Ass'n., Box S157, Tarzana, California.

MONEY meat and furs raising rabbits. Free particulars. Willard's, Canoga Park, California.

FREE Book "372 Unusual Worldwide businesses." Work Home (U.S.A.)! Publishers-23B, Carlsbad, Calif.

23 BOOKS & MAGAZINES

MAGAZINES (back dated)—foreign, domestic, arts. Books, booklets, subscriptions, etc. Catalog 10c. (refunded). Cicerone's, 86-22 Northern Blvd., Jackson Heights, N. Y.

BOOKHUNTERS! Scarce, unusual, miscellaneous books supplied. Atlantic Book Service, 2 Lawrence, Charlestown 29, Mass.

WANTED—Thousands of used books to swap for ours. Write for details. Read's Book Exchange, 3822 Villa Terrace, San Diego 4, California.

PSYCHIC Powers, Psychic Problems, Superfaculties, three booklets totaling 227 pages, for $1.00. Jordan, 1130 Keller Avenue, Louisville 13, Kentucky.

BOOKHUNTERS! All Subjects. Send Wants! Jaher Book Service, 620-K East 178 Street, New York 57.

HYPNOTISM simplified! Complete monolog, instructions. "You Can Hypnotize" $1.00. Hypnotism, 1978 Dartmouth Avenue, Columbus 3, Ohio.

HARD-To-Find Books supplied. Send wants. Pierce's, Winthrop, Iowa.

POCKET Book Swap! Send 12 books plus $1.00, receive 12 different. Jack Craft, R.D.#2, Delmar, Delaware.

STRANGE Stories! Sample and illustrated literature, 25c. Exchange, Fitchburg 23, Mass.

COMIC books—illustrated. 20 Booklets, all different, $1.00. Terry Thorne, Box 15535, Crenshaw Station, Dept. PS-4, Los Angeles 8, California.

PIN Ups. Breathtaking Beauties! 68 Large photos $1.25. Giant Edition 132 Photos in Plastic Portfolio $3.00. A must for all photo collectors. Special Gift with $3.00 order. Rarepix, Box 11535, Los Angeles 48, California.

JUMBO Humor Package—12 Dynamic Illustrated Joke books only $1.00 with Fascinating catalog. Aladdin Book Co., 210-S Fifth Avenue, New York 10.

BACK-date Magazines. Specific issues; years. Arkell's, Tarzana 2, Calif.

ADULT Books—Illustrated Comic Booklets, 12 for $1.00, 24 for $2.00. All Different. Free gift with each $2.00 order. V. M. Rogers, Dept. PS, Box 14738, Cimarron Station, Los Angeles 18, Calif.

ADULT book bargains. Send stamp. Vallon, 63 Perry, New York 14, N.Y.

24 GAMES & ENTERTAINMENT

ADULT novelties asst. $5.00 express. Tupler, 216 W. Jackson, Chicago.

Copyrighted material

QUIZ-Bingo, Globe-Rummy, Triple-Deal, Madame-X. Four complete games with playing cards, $1.00 Postpaid. P.O. Box 842, Denver 1, Colorado.

LIVE action, four miniature race horses actually run on track. New, exciting. One Dollar. 8318 Ridpath, Hollywood 46, Calif.

25 MAGIC TRICKS, PUZZLES, ETC.

MAGICIANS'. Gamblers' secrets exposed. Cards, Dice, Punchboards, Slot Machine. Catalog 10c. Book Co., Box 671, St. Louis 1, Mo

WE supply every noted magician. Large professional catalog $1.00. Holden's, P220 West 42nd Street, New York.

"VENTRILLO," Professional Voice Thrower and Catalog 25c! Box 971-PS, Philadelphia.

LATEST Magic for pocket, parlor, stage. Catalogue 500 Tricks, only 10c. Unequalled magic service for 30 years. Douglas Magicland, Dept. 2, Dallas, Texas.

200 ELECTRIC stunts $1.00. Cards $1.00. Cutting Sons, Los Altos, Calif.

TEN assorted snappy Hollywood Gag Cards, $1.00. Fun, 8946 Vermont, Los Angeles 44, Calif.

VENTRILOQUISM Taught. 3c stamp brings particulars. Smith, 801 Bigelow, Peoria 5, Illinois.

LUMINOUS Rubber Skull Mask $1.49. Becomes "alive" when worn. Eat, talk, smoke. Horrifying in dark or light. Johnson Smith, Dept. 423, Detroit 7, Mich.

FREE trick and large illustrated catalog —35c. Lerro's Magic, 509 80th Street, Brooklyn 9, N. Y.

512-PAGE catalogue of 2500 tricks, pocket, parlor, stage. World's Finest Magic. Send $1.50 for catalogue (refunded first $6.00 order). Kanter's, S-1311 Walnut, Philadelphia 7.

BE a Magician. Large professional magic catalog of latest tricks, 35c. Ireland, F-109 North Dearborn, Chicago.

PLASTIC ventriloquist dummy with moving eyes and lips. Instructions included 25c. Roalex, 26 West 39th Street, New York.

MAGIC Package 50c. Balancing Penny 50c. Twisto, the Magician, 716 Pine, St. Louis.

PROFESSOR Owens' card miracles. Six easy to do card tricks. Be the life of the party. Send one dollar, no stamps—Professor Owens, Post Office Box 333, Long Beach, California.

MAGIC Monthly. Year 25c. Sample and Magic Catalogue free. Magic Shop, Minneapolis 2, Minn.

TRICKS, Funmakers, Novelties, Sneezing Powder, Surprises. Complete Selection 10c. Andersen's, 6815S Ardmore, Chicago 31.

26 COIN COLLECTING

FREE! Foreign coin, banknote and Coin Collectors' Illustrated Catalog to approval service applicants. Send 3c postage. Tatham Coin Co., Springfield-D50, Mass.

GET Profit and Pleasure in collecting old coins. Send 10c for 56-page illustrated coin catalog. You'll be delighted with it. Send for it now. B. Max Mehl, 374 Mehl Building, Fort Worth, Texas. Largest rare coin establishment in U. S. Established 51 years.

OLD Money Wanted. Will pay Fifty Dollars for nickel of 1913 with Liberty Head (not Buffalo). We pay cash premiums for all rare coins. Send 4c for Large Coin Folder. May mean much profit to you. Numismatic Co., Dept. 30, Fort Worth, Texas.

$10.00 EACH for certain Lincoln pennies. Indianheads $50.00. Send dime for catalogue listing prices paid. Lincoln Coin Company, Elkhart 4, Indiana.

1881-S, 1951 UNCIRCULATED Dollars! $3.00 each. Willard, 5719 Kenmore, Chicago 40.

FOREIGN coin bargains. List free. Lyle Andrews, Box 677, Sumner, Wash.

FOREIGN money, two wooden nickels, and "Coin Collector's" new magazine. 10c. Lawrence Brothers, Anamosa, Iowa.

COMMEMORATIVE $½ — Columbus, Washington, Cleveland, Stone Mountain, $2.00 ea. Illustrated Catalogue 25c. Norman Schultz, Salt Lake 9, Utah.

BEAUTIFUL English Set (9) 1950 Proof Coins in Special Box $3.25. Giant Bargain Catalog 25c. Bebee's, 1180 East 63rd, Chicago 37, Illinois.

50,000 COINS, medals, bills, lists free. Nagy, 8-P South 18th., Phila. 3, Penna.

LOOK! Four Whitman Folders $1.00. Price list 10c. Ray's, 109 Mathilda, Sunnyvale, Calif.

DOLLAR Lots! Grab Bags! Bargains galore! List 10c. Fairway Company, Rye, N.Y.

BARGAINS! Rare collections, 50 different dates. United States large cents $15.00 —15 different $3.00—40 different indianhead cents $4.00—20 different $1.00—30 assorted $1.00—1864L cent $2.00—18 dates libertyhead nickels $2.00—8 dates 2c pieces $2.00—1809 half cent $1.00. Complete Buying-Selling Catalogue 25c. Worthy-coin Corporation (D-412), Boston 8, Mass.

27 OLD STAMPS WANTED

I WILL Pay $100.00 each for 1924 1c green Franklin stamps rotary perforated eleven (up to $1000.00 each unused). Send 10c for Large illustrated folders showing Amazing prices paid for old stamps, coins & collections. Vernon Baker, PS-110.

28 STAMP COLLECTING

200 DIFFERENT, including Roosevelt triangle, 5c to approval applicants. S. Avalon Stamp Co., Springfield, Mass.

AMAZING Offer! 500 United States stamps—including commemoratives, airmails, high values to $5.00—Only 10c to Approval Applicants!! Illustrated Bargain Lists free. Mystic Stamp Co., Dept. 55, Camden, New York.

COLUMBIANS, Trans-Mississippi, Pan-Americans, Pan-Pacific, ten other different commemoratives. All 10c with your request for US approvals. Moda Stamps, Box 251-V, C.S.A., New York 8.

WORLD'S Largest Stamp (7½ x 14 inches). A real curiosity! Retails for 50c, only 3c to approval applicants. Tatham Stamp Co., Springfield 50, Mass.

"HOW To Recognize Rare Stamps." Free Book Illustrated! Kenmore, Richford H-58, Vermont.

WOW! 203 All Different Germany 10c! Zeppelins, Semipostals, Airmails, High Values, etc. to new customers. Jamestown Stamp, Jamestown 509, New York.

500 EXOTIC Japan Stamps—10c! Kenmore, Richford J-58, Vermont.

FREE—Complete set of Famous Americans, Flags, Parks and Presidentials to approval buyers. Send 3c for 15 of the above stamps plus full particulars. Triboro Stamp Company, 145 Nassau Street, Dept. 210, New York 38, N. Y.

FREE—Illustrated Catalog! Kenmore, Richford C-58, Vermont.

750 FRANCE and colonies stamps 10c. Littleton Stamp Co., Littleton 26, N. H.

U. S. COLLECTORS—write today for free material. Eagle Stamp Co., 2221-B Romine, Pittsburgh 26, Pa.

500 STAMPS For Only 10c! This mammoth value includes Airmails, Pictorials; stamps from strange countries cataloguing up to 25c each!! Also approvals. Mystic Stamp Company, Camden 55, New York.

FREE! Powerful Magnifying Glass. Jamestown Stamp, Jamestown 207, N. Y.

EXCHANGE Stamps Universe. Particulars free. "Exchangers", Bry 118, Seine, France.

77 DIFFERENT United States—25c. Approvals. Utechts, 1143-A North Keller, Chicago 51.

300 DIFFERENT given free with approvals. Postage 3c. Windsor Stamps, 1435 E. 67th Place, Chicago 37.

18 VALUE Greece pictorial set. Free to approval buyers. Pleasure Stamps, 1865A 52nd Street, Brooklyn 4, New York.

1050 DIFFERENT Stamps given to approval applicants becoming customers. Send 3c for particulars, lists and approvals. Bryson Stamp Company, Drawer F-30, Rossford, Ohio.

DEALERS Wholesale catalog. Postage 3c. Franksco, 5031 Queensbury, Baltimore, Md.

"HOLY" triangle. "Orchid" diamond. 51 others, 4c. Approvals. Kalamazoo Stamps, Box 333-S, Kalamazoo, Mich.

FREE—World's only Giant "Cardboard" Triangle. Approvals, Beaman, North Miami 10, Florida.

3 GOLD-Silver Giant Triangles—3c. Approvals. Iroquois, Baltimore 5, Md.

POUND stamps containing thousands $1.00. Longacre Shop, 581 Sixth Ave., New York City 11.

FINE Approvals. Fast, personal service. What countries do you prefer? I'll send their stamps. Milton Skinner, 438 Locust.

ROOSEVELTS complete, plus 25 other U. S., 10c with United States approvals. Locust, Box 305-A, Harmon-on-Hudson, New York.

PREMIUMS. Prized. 2c approvals. Gigantic Selections. Raymax, 123-X William St., New York City 38.

EMPTY Spaces? Try my selected approvals 60%-70% discount. Newfeld, 643 Eastern Parkway, Brooklyn 13, N. Y.

COLLECTION At A Standstill? Let us show you our top quality 1c to 5c approvals. Many satisfied customers. Write today. References appreciated. Roseland Stamp Co., Dept. 9-D Spring Lake, Mich.

FREE "Stamp Finder." Tells instantly country to which any stamp belongs. 32 pages profusely illustrated. Garcelon, Calais 18, Maine.

FREE with approvals, commemorative sheet catalog 40c. Stamp House, 1463 Drexel Avenue, Miami Beach 39, Florida.

LOOKING for Bargains? Try our 1 & 2c approvals mounted in books of 1,000. We believe in both quantity and quality. First try will satisfy. Clark, Box 544U2, Muskegon, Michigan.

10,000 DIFFERENT 1c each! Gordon Davison, Box 1019, Manchester, N. H.

50 BRITISH Empire 10c approvals. C. Smith, Box 6618 Northeast, Kansas City, Mo.

FREE! 50 Different Japanese stamps! Approvals. Star Stamps, 225 Willard, Jamestown 24, New York.

FREE! 100 different China to new approval applicants. C. Moumblow, 740 Hegney, Bronx 56, New York.

$1.00 AND $2.00 Hong Kong (catalog 35c) 5c. Approvals. Free gifts. Claire's, 7402 Bay Parkway, Brooklyn 4, New York.

WORLDWIDE stamps, 1050 all different —$1.00; 5000—$12.50. Bargain lists free. Beacon Sales, Maynard 3, Miss.

NO rarities, no junk, just good solid approvals for solid collectors. Dominion Stamp Company, Arlington, Va.

FREE! "King Size" stamp of Japan. Attractive approvals. Grey, 46 Lent, Poughkeepsie, New York.

PENNY Approvals by country. M. H. Hoerning, 102, Farmington, Ark.

WE Give Away—Your Choice Latest Scotts Albums; Catalogue and available philatelic accessories. Realize—You Get These Worthwhile Rewards When You Buy From Our Better Foreign Approvals. Write Today For Full Particulars Sent With Trial Approval Selection. Americas' Stamp Service, Riverside, Calif.

SAN Marino Collection Free—25 different, Old and New Issues, airmails, commemoratives, high values—absolutely Free with approvals. Viking, 130-PP Clinton St., Brooklyn, New York.

FREE very large Japan Flying Geese Stamp. Approvals Included. Hathaway, P. O. Box 211-S, Hempstead, New York.

FIFTY different United States; commemoratives, dues, etc., All for 10c. Ed Keller, Library 2, Penna.

50,000 STAMP Grabags 25c each. Anderson, 630a Bingaman, Reading, Pa.

Copyrighted material

FREE ten beautiful Ceylon and Canada Pictorials with U. S. or British approvals. Gables Stamp Studio, Box 985-S, Coral Gables, Florida.

GOOD Packets build good collections. Write for Free lists. Myers, Box 222, Lansdowne, Penna.

$1.00, $2.00, $4.00, $5.00 U. S. Given with approvals. Southern Stamp Co., Box 70, Miami, Florida.

BARGAIN! 100 different United States Stamps, including commemoratives, airmails. 10c to approval applicants. Sunset Stamp, Dept. 26, Box 47, South Gate, Cal.

FIRST U. S. (1847) Government Reissues 5c, 10c, plus Giant Bargain U. S. Collection—only 5c to applicants U. S. approvals. Metropolitan, Box 312K, Jackson Heights, N. Y.

UNITED States stamps nearly 100 years old. Roosevelt set, others, 40c value—only 6c to applicants United States approvals. Wakonda, Box 272-H, Jackson Heights, N. Y.

POLAR Bear Triangle; Giant George Washington Six Colored Ecuador, Arctic Triangle, first American commemorative, Corsica, Devils Island, others. Everything free with approvals. Capital Stamps, Little Rock 10, Ark.

DIFFERENT. 25 Canada, 25 U.S., 25 Switzerland. All 3c. Approvals. Aletalo, Maynard, Mass.

TASMANIA, Thailand, Israel, Victoria, free with approvals. A-to-Z Stampco, Box 36, Miami Beach 39, Florida.

50 DIFFERENT U. S. 10c. No Approvals. Seidenberg, 944, Appleton, Wis.

JUMBO approvals. 1,000 different each selection. Just 1c and 2c each. Postage paid both ways. Stone, 45-S Bromfield, Boston 8, Mass.

PHILIPPINES—25 different only 10c. Colorful 2c approvals. Moffat, 921 College, Rock Hill 3, South Carolina.

U.S. Price List free. Petter Wetterquist, 1635-13th Ave., Rockford, Illinois.

WONDERFUL Offer 7 complete mint sets Manchukuo, Bohemia, etc. only 10c, with approvals. Reich Stamp Co., 4647 Kenmore, Chicago 40, Ill., Dept. S23.

$33.00 FOR $1.00!! 1,010 Different Stamps Cataloging $33.00—Only $1.00. Including Approvals. Stampex, 116-PS Nassau, N.Y.C.

307 ALL Different—Only 15c! Beautiful collection: Commemoratives, Triangles, High Values, Bicolored Stamps, etc. Garcelon, Calais 418, Maine.

PENNY Approval Bargains!—Write Dept. PSM, 1267 Tutwiler, Memphis 7, Tenn.

GOYA Nude—with approvals, 3c! Stearns, 1249-c Griswold, Detroit 26, Michigan.

COLLECTION of 500 Different—just 25c!! "Beginners' Delight" approvals included. Niagara Stamp Company, 24 Queensway, Niagara-on-the-Lake, Canada.

FLAG Stamp—Free with hygrade U. S. approvals. Weniggman's, 1933 Patterson, Chicago 13.

NUDES Set; colorful approvals—10c! Atlas, 2830-p Eisenhower, Racine, Wis.

ALBUM! Holds 2000 stamps! Only 10c! Glamore Company, Manchester 1, Conn.

LAUGH at Inflation! Thousands of fine stamps, just 1c-2c! References brings sample book of 1000. Niagara Stamp Company, 21 Queensway, Niagara-on-the-Lake, Can.

JAMAICA Mint Coronation Set, 10c. Approvals. Zimmer, 722 Culver, Rochester 9, New York.

FREE 100 Different with Approvals. Henry Bardsley, Arlington Ave., Roslyn, Pa.

GOOD Packets build good collections. Write for Free lists. Myers, Box 22, Lansdowne, Penna.

SPECIAL: 5-5c-sets-5c, with approvals. Lawrence, Box No. 1616, Hartford 1, Conn.

POUND mixtures. U. S. or Foreign, $1.00. Book Nook, Willmar 61, Minnesota.

½c—1c APPROVALS! Bargains galore! Cole, 43-g Rinewalt, Buffalo 21, N. Y.

FREE Details stamp or coin exchange. Superior Exchange, Grafton, Ohio.

50 DIFFERENT Scandinavia only 10c. Kimber, Box 278, Norrkoping, Sweden.

FOR Free! Big new illustrated catalog! Albums — stamps — collections — supplies "Stamps By Mail", 2133 Lunt, Chicago 45.

FREE!! Triangle—Diamond—Midget—Giant—Roosevelt—Hitler stamps to new customers. Thrifty Stamps, Silver Spring, Maryland.

343 DIFFERENT—43 countries 25c. Approvals. Cs. Reitter, Box 1505, Detroit 31, Michigan.

FREE Beginner's packet Price list. Stampinground, Box 55, Glastonburg, Conn.

FREE!! Amazing "Queer Countries" Packet—with approvals! Saxon, Vista, California.

FREE 750 Mixed U.S. Send 10c Postage. Weatherby, Medina, Ohio.

500 STAMP hinges and 25 different Canada 3c with approvals. Jaydee, 218 Dickinson S.W., Grand Rapids 7, Michigan.

"GOYA Nude" set (Catalogs 55c) 15c with approvals. Royal Stamp Company, Tamaqua 2, Penna.

FREE Collection—over 100 different stamps of world—commemoratives, animals, natives, ships, famous men, others all to approval buyers; also Scott Albums, Catalogs. Bell Stamp Service, Dept. W-3, Bell, California.

U.S. 797 SPA Sheet only 5c to applicants for U. S. approvals. M. Haycock, 235 86th St., Brooklyn, N. Y.

SOUVENIR Sheet Free if you request approvals. Knight, Box 3770, Portland 88, Oregon.

15 DIFF. 19th Century. Given to approval applicants. Rossom, 218 West 59th Street, Chicago 21, Ill.

SEVEN complete mint sets 10c, approvals. Queensway, Box 150, Toronto 18, Can.

SPORTS—pictorials—5 sets only 5c. Approvals. Wirth, Norwichtown 1, Conn.

FREE Sample—Interesting, Informative, Enjoyable. National Stamp News, Anderson 2, South Carolina.

22 ROOSEVELT Commemoratives 25c. Interesting Approvals. Robert Wilks, Beverly, Mass.

FOR as little as $8.00 you can put your ad here in the December issue. Get in on the Christmas mail-order rush and deliver your sales talk direct to the 3,992,000 readers of Popular Science. Special classification "Christmas Gifts"—available for this issue. Same low rate you've always paid—80c a word. The December issue closes on October 25th! Write today for order blank and free booklet, "How To Make Money Out of Classified Advertising." O. K. Kelly, Classified Advertising Manager, Popular Science Monthly, Dept. B, 353 Fourth Avenue, New York 10, New York.

29 ANTIQUES, RELICS & INDIAN GOODS

4 FINE ancient Indian arrowheads $1.00. Fine stone tomahawks $2.00, $3.00. List free. Lear's, Glenwood, Arkansas.

GET Catalog #17—Selling 500 Historical Firearms, 20,000 Indian Relics, Coins, Collectors Cartridges—Revolutionary, Civilwar, Indianwar Muskets, Flintlocks, Rifles, Pistols, Swords, Bayonets, Ramrods, Bulletmolds, Percussion Caps, Powderhorns.—Arrowheads, Wampum, Tomahawks, Spearheads, Gempoints, Discoidals.—Agates, Minerals, Fossils, Marine Shells.—Mounted Pheasants, Deerheads, Owls, Quail, Squirrels, Steerhorns, Blo-horns, Bo-wood, Violin Wood, Buffalohorns.—Kentucky Rifles, Winchesters, Gold Dollars, Carbines. Profusely illustrated catalog 35c. Heike, Wenona 38, Illinois.

SPECIAL: 10 Indianheads, $ .68—Civilwar Bayonet $1.98—Civilwar Sword $8.88—Deerhead $28.50—Civilwar Musket $28.50—10 Arrowheads $1.88—Tomahawk $3.45—Scalping Knife $1.87—Agate, Pyrite, Molybdenum, Fossil, Geode, Gempoint, Crinoid, Blastoid, Gastropod, each $ .48. Heike, Wenona 38, Ill.

30 MINERALS & PRECIOUS STONES

FIND Tungsten, mercury, uranium with Mineralight. Free brochure. Write Dept. PS8. Ultra-Violet Products, South Pasadena, Calif.

GEMCUTTING, Silvercraft authority. Illustrated magazine tells how. Cut rocks, make jewelry. 150 ads illustrating equipment, offering gems for collectors, cutters. Postal brings literature. Lapidary Journal, Drawer D, Palm Desert, Calif.

GEMS, Precious and semi-precious, all genuine, from world wide sources. Deal direct, no overhead, save money. Catalog 10c. Hill Co., Route 7-K, Salem, Oregon.

GEMSTONES, Mineral specimens. Every variety. Lowest prices. Postcard brings free booklet. Plummer's, 2183D Bacon, San Diego 7, Calif.

QUARTZ, Jasper, Agate and Catalog 25c. Gemco, Elkhart Lake 2, Wisc.

31 HOBBIES, COLLECTIONS

INVENTING can be an interesting and profitable hobby. Write for complete particulars. Institute of American Inventors, Dept. 30-E, 631-E St., N. W., Washington 6, D.C.

UNUSUAL shellcraft kit in plastic segmented box $10.00 value—$2.98 postpaid. Ben Davidson, 370 South 2nd Street, Brooklyn 11, New York.

WANTED Cigarette, tobacco, cards. Write Charles Bray, East Bangor, Penna.

SHIP Model Catalog. Kits, fittings. 160 pages. Money-Back Coupon—50c. Antique Cars, vehicle catalog 15c. Polks, 314-PS Fifth Ave., New York 1, N. Y.

UNUSED matchbook covers—100 different $1.00—36 page Catalog 25c—Charles Edelman, 1311P East 84, Cleveland 3, Ohio.

32 PHOTO FINISHING, PHOTOCOPIES, ETC.

YOUR eight exposure roll developed with three prints each good negative 50c; two each 40c; one each 30c. Reprints 3c. A few cents postage appreciated. L. A. Eastman, Bode, Iowa.

24 GLOSSY photos $1.00. (6 sets 144 photos $5.00). Beautiful models, all different, glamorous poses, the kind you will like. Catalog 50c, none free. Nutrix Co., Dept. D-51, 212 East 14th St., New York 3, N. Y.

8 CONTACTS 30c, jumbos—40c, 12—45c. Jumbos—55c, reprints—4c, jumbos—5c. Free mailers. Western Photo PS101, Box 298, San Francisco 1, Calif.

PHOTOCOPY Anything—Papers, books. No darkroom. 8½"x11" complete $6.95. Fotoflek, 8555 Plainfield Lane, Cincinnati 35, O.

FILMS, highest quality, rapid service, eight super size prints, 50c. "Camera," Box #280, West Chester, Penna.

33 MOTION PICTURES, SLIDES SOUND EQUIPMENT

MOVIE Camera Film: 8mm roll $1.50, 16mm 100' $3.00. Free processing. Better Films, 742 New Lots, Brooklyn, N. Y.

LATEST Beauty Glamour Films. Sample, 8mm 50 ft. only $3.75. 25c brings exclusive catalog of movie titles. Empire, Dept. PS-10, Box 23, White Plains, N. Y.

GUARANTEED Fresh 8mm roll, magazine; 16mm roll, magazine movie film. Color, b&w. Free catalog. Eso-S, 47th Holly, Kansas City 2, Missouri.

8-16MM, Silent-sound films. Complete rental library. All latest subjects. Free catalogue, (sample film 10c). Garden Film, 317 West 50th, New York 19.

UNUSUAL 8-16MM. Movies. Full-color projection length sample, $1.00. Color Tru-Art Slides, three samples $1.00. Big catalog, 25c (refundable). National Film Supply, Toledo 9-E, Ohio.

RENT 16MM sound films 50c reel. Large selection; free catalog. U. C. Film Service, 128 Chestnut St., Roselle Park, N. J.

KODACHROMES on approval Western National Parks Catalogue and sample 30c. Douglas Whiteside, Yosemite, Calif.

Copyrighted material

5,000 NEW-Used 8-16mm. Silent-Sound Films. International, 2120 Strauss, Brooklyn 12, New York.

ART Film. Slides. Free list. Samples $1.00. Price Brothers, 64-C West Randolph, Chicago.

FOR as little as $8.00 you can put your ad here in the December issue. Get in on the Christmas mail-order rush and deliver your sales talk direct to the 3,992,000 readers of Popular Science. Special classification "Christmas Gifts"—available for this issue. Same low rate you've always paid—80c a word. The December issue closes on October 25th! Write today for order blank and free booklet, "How To Make Money Out of Classified Advertising." O. K. Kelly, Classified Advertising Manager, Popular Science Monthly, Dept. B, 353 Fourth Avenue, New York 10, New York.

34 CAMERAS, PHOTO SUPPLIES

FREE Photographic Bargain Book packed with hundreds of sensational values in still and movie cameras, lenses and latest accessories. Super savings for you in new and used equipment. Liberal trade-in allowances, too, on your equipment. Write now for your free copy to Central Camera Company, Dept. 2-M, 230 S. Wabash Ave., Chicago 4 (Photographic Headquarters Since 1899).

BASS Says: Trading cameras a national habit since 1910. Write to Bass the old "Horse Trader." A postcard will do. Simply say: "Bass, I have and I want . . . How much will you allow me?" Satisfaction guaranteed. Bass Camera Company, Dept. AG, 179 W. Madison St., Chicago 2.

PHOTOGRAPHY for pleasure or profit. Learn at home. Practical basic training. Long established school. Write for Free Booklet. American School of Photography, 835 Diversey Parkway, Dept. 1746, Chicago 14.

ADD "Spice" to home projection shows with colorful old-time Nickelodeon slides. 2x2. Write for Free list. Nickelodeon Co., New Fleidner Bldg., Portland 5, Oregon.

BOLEX H16 Leader, still in factory packing, $182.80. Free catalog. 1001 bargains. Dealers Mart, 11 Willard Ave., Mt. Vernon, New York.

PHOTOMURALS. Your negatives or ours. Catalogue 25c. Photomammoth, 12048 Vanowen St., North Hollywood, Calif.

BUY Photographic Supplies Wholesale. Films, cameras, projectors, enlargers, binoculars. Free catalog. Capitol Photo Supplies, 2428 Guadalupe, Austin, Texas.

35 MUSIC, INSTRUMENTS & SONG WRITERS

POEMS Wanted to be set to music. Free examination. Send poems. McNeil, Master of Music, 510-PS, S. Alexandria, Los Angeles, California.

WANTED! Poems for musical settings. Write Songwriters' Service, Clifton, N. J.

POEMS Wanted. Broadcast consideration. Sooner Song Co., 22 Northwest 8th, Oklahoma City 2.

POEMS Wanted for musical setting. Send poems for free examination. Five Star Music Masters, 646 Beacon Bldg., Boston, Mass.

SONGWRITERS! Outstanding, ethical offer. Hibbeler, C-15, 2157 N. Avers, Chicago, 47.

ELECTRIC guitars, amplifiers, wholesale. Free catalog. Carvin, PS, Baldwin Park, Calif.

SONGWRITERS! This is the Thing!! Free information. Trans-World Music Co., 6356 Hollywood Boulevard, Suite 230-4, Hollywood 28, Calif.

SONGWRITERS! Send poems, songs. Music Service, 243 West 72nd St., PS, New York 23.

TEACH yourself to play piano professionally, from notes; compose songs; or sing. Also we put music to your poems. Music Teachers' Associates, 26½ Potters Lane, Great Neck, N.Y.

YOUR words given melody; recorded by professional pianist-vocalist. Free details. Wescourt, 216 W. Jackson Blvd., Chicago.

SWISS musical nursing bottle. Musical movements $1.00. Catalog 10c. Bell Music, Box 49, Planetarium Station, N.Y. 24, N.Y.

36 RADIO, TELEVISION, SUPPLIES & EQUIPMENT

MAKE simple, tubeless, batteryless, distance-getting crystal radios. Crystal and illustrated instructions 25c postpaid. Allen, 427-S. Clinton, Mo.

NEW 6 to 110 volt converters 60 cycle 35 watt $15.95 guaranteed, check or M. O. Munson Co., 1470 Midway Parkway, St. Paul 4, Minnesota.

FREE! 212 Page Radio-Television-Electronic Catalog! World's largest stocks, lowest prices. Complete supplies for builders, experimenters, amateurs, servicemen. Latest radios, phonos, television, recorders, sound equipment. Thousands of parts, tubes, test instruments, books, diagrams. Top quality money saving values. Get yours now! Allied Radio Corp., 833 W. Jackson Blvd., Dept. 34-A, Chicago 7, Ill.

BUILDER'S "Pictorial Construction Plans". Free List. Alena, Box 24, Astoria 6, New York.

MAKE Distance-Getting crystal radio that works. Fully illustrated booklet fifteen cents. Money back guarantee. Francis, Box 5963, Cleveland, Ohio.

ENGINEERING-Service-Radio and Electrical—Henry Twillmann, R.R. #1, Chesterfield, Missouri.

DIODE type crystal detector. 75c. Ideal for crystal sets. Instructions. Clearco Crystal Co., Box 1857, Milwaukee 1, Wisconsin.

VEST Pocket Crystal Radio. Send 10 cents for drawings. Bill Cotter, Washington 18, D. C.

GET Ready Now For A Good Army Job! New Code-Voice Record Method teaches you Morse Code in just 8 hours, qualifies you for new Novice Class Amateur Radio Operator's license, Scout signaling tests. You get four sides of code on two 10-inch, 78 RPM, Vinylite records in handsomely illustrated instruction album. Send only $4.00. Money-back guarantee. Dept. P-1, The Raybrun Company, Box 66, Orangeburg, New York.

TELEVISION Filter. Eliminates glare, soothing to the eyes, used by movie studios to neutralize actinic rays, does not discolor or distort picture. 10-14 inch $1.00. 16-20 inch $2.00. T-V Products, 7859½ Melrose, Dept. 4, Hollywood 46, California.

TELEVISION Telescoping 50 foot Steel Mast, housetop, simple one-man installation, with 40 element 4-stack V-cone all-channel antenna, reception to 200 miles, complete installation kit $89.00. F.O.B. Television Engineering Co., 303-34th St., Bakersfield, California. Check or Money Order. Practical detailed fringe area instruction manual and tips, $1.00. (Kit with 40 foot mast—$79.00, 60 foot—$115.00. All masts 10 foot sections, top section 1-3/16" O.D.)

COLOR TV on your set. Full details 50c. Chalfin, Box 1193, LaBallona Sta., Culver City, Calif.

AMATEUR Radio license preparation. Correspondence course. Low cost. Personal coaching. Federal Electronic Institute, 34 E. Putnam, Dept. A, Greenwich, Conn.

37 BUSINESS OPPORTUNITIES

"SCHOOL Students" can make $3.20 an hour, Saturdays, in your own neighborhood. Soliciting. Harry Walters, Mediapolis 1, Iowa.

TO $35.00 Weekly. Spare Time. Home Operated Mail Order Business. Successful small "beginner's" plan. Everything Supplied. Lynn, 5710-C Bankfield, Culver City, California.

GOOD Paying Business Silvering mirrors, plating autoparts, reflectors, bicycles, bathroom fixtures, etc., by late methods. No tanks or shop required, outfit furnished. Free Booklet. Gunmetal Co., Ave. E, Decatur, Illinois.

ENVELOPES addressed accurately, reasonably. Fast Service. We have capable addressers in your city. Glenway System, 5713-X Euclid, Cleveland 3, Ohio.

NATURAL Molding Latex. Extra thick. Free sample. W. Wooley, 115B Donald, Peoria, Illinois.

OPERATE profitable mail order business. Write Walter Service, 4159-B East 112th, Cleveland 5, Ohio.

MAKE money addressing envelopes. Our instructions reveal how. Glen Glenway, 5713 Euclid, Cleveland 3, Ohio.

HOW and where to obtain Capital? Free details. Star Service, Wapakoneta, Ohio.

BIG money! Spare or full time in your home. No Selling! Spray New Miracle Finishes, Plush and Suede, on signs, radios, automobiles, figurines, lamps, toys, etc. Our business is booming. Help us fill huge demand. New easy Flok-Kraft methods. Material costs few pennies. You get dollars. Free samples, complete powerful money making plan free. Write now. Coast, 1002-N, Los Angeles St., Los Angeles 15.

FABULOUS Earnings—Fascinating pastime. Growing Genuine, living miniature (Ming) Trees. New sensational Business or Hobby. Astounding information Free. Dwarf Gardens, Box 355H, Briggs Station, Los Angeles 48, Calif.

RECAST old batteries into new. Latest achievements. Battery Laboratories, Minneapolis.

START a Venetian Blind Laundry. Profit opportunity for lifetime business. New machine method. Free booklet on request. F. D. Co., 442 N. Seneca St., Wichita 12, Kansas.

MAKE Money spare or full time casting Metal Toys and Novelties. Big wholesale and chain store demand for Autos, Soldiers, Ashtrays, Banks, etc. Keeps manufacturers busy. Production moulds furnished for up to 100 and more castings per hour. No experience or special place necessary. "Cash-in" on holiday orders now being placed. Write for information and illustrations of patterns needed. Metal Cast Products Co., Dept. E, 1696 Boston Road, New York 60, N. Y.

LIQUID Rubber, make flexible molds. Free Sample. Chaney, 1130 E. 16th St., Jacksonville 6, Fla.

TRAVEL Anywhere, Anytime. Earn $50 up a week. Free details. Travel, La Grange 22, Indiana.

IMPORT—Export! Men—Women learn from established World Trader. Your own profitable world wide business by mail order from home without capital; or travel abroad. Experience unnecessary. Free details. Mellinger, A-8, Los Angeles 24.

VENDING Machines earn big money! An investment as low as $10.50 will start you in this fascinating, profitable business that can lead you to the road of success and independence. Routes can be established and operated in either full or spare time with no experience needed. Write for full details and our Free catalog illustrating our nut, candy, gum and stamp vendors; also pin ball machines, music boxes, etc. Write immediately to: Parkway Machine Corporation, Dept. 9, 715 Ensor Street, Baltimore 2, Maryland.

MAKE Money At Home as renewal headquarters for all magazines. Big Christmas sales profits now. Liberal commissions. Supplies furnished. Write for Free catalog. McGregor Magazine Agency, Dept. 510B, Mount Morris, Ill.

SELL by mail; free details; instructive booklet 25c. Manhattan House, P.O. Box 51-L, St. Albans 12, New York.

BOOKKEEPERS. Operate simplified bookkeeping service CPA designed, double entry system. Illustration manual $1.00. Kern, 4942A Vineland, North Hollywood, Calif.

CASH In! Make Reflective Nameplates and novelties. Easy. Big profits. Free samples. Highlight, 352-S Stewart, Turtle Creek, Penna.

POPCORN Equipment, Potato Chip Outfits. Long Eakins Company, 5163 High, Springfield 99, Ohio.

START Mailorder Bookshop—Everything furnished. 25c brings booklet, samples, exciting ideas. General Publications, Ossining 1, New York.

SEWING Machine Spare Time Repairmen Wanted. $125.00 week reported. "Hang out your Shingle". We train, and furnish you everything. Write Taylor Service, Hamilton, PS-10, Ohio.

Copyrighted material

EARN Money At Home With Your Typewriter! Spare time! Details free. Edwards. Publisher. 3915-PS. 12th. Des Moines 13. Ia.

DOLLARS daily, writing. My way guaranteed. Details, ideas, booklet, rush 25c. F. Loeb. Cincinnati 36.

BE An Exterminator—formulas, secrets, what to charge; free particulars, etc. Ray Knox. 1208 Walnut Street. Phila., Penna.

MAKE Mail Order Business pay. Necessary Basic Knowledge. Recommended by mail order experts. Only 25c. Maxted Book Agency. Western Springs 15. Ill.

HIGH earnings. Sell Lite money-back-guarantee Binoculars. Details free. Lite Scientific Co., 123 Audit. Circle. San Antonio. Texas.

$25 WEEKLY Working two hours daily. No canvassing. No manufacturing. Lycke. Box 2471-B. Cleveland 12. Ohio.

PROFITABLE home business or travel abroad. Lifetime opportunity in Export Trade. Free Booklet. American Export Counselors. Box 569. Westport. Conn.

GET Into Plastics the Professional Way! The inexpensive way. Learn where, how to contact waiting customers. Make better plastic products by new easier methods. Save on materials. Information worth fortune. Details free. Plastic Service. Dept. SPS. East Boston 28. Mass.

$10. HOUR! World's most complete invisible textile reweaving instructions, including 17 samples, 48 lessons, automatic latch steel tool assembly, material for life $3. complete. Guaranteed as represented. Details free. Walsh. 894 Main. Buffalo 2. New York.

TRADE Magazines—Help You to Success Get latest copies through our easy-to-get-acquainted service. Nearly 1,200 business, vocational, craft, hobby, selling, etc. 235 classifications covering all interests. List Free. Commercial Engraving Publishing Company. 34S North Ritter. Indianapolis 19. Indiana.

YOUR own profitable home business. Preserve live flowers to last forever. Spare or full time. New discovery—simple—fascinating. No experience necessary. Send $2.00 for working equipment, instructions and valuable sales plans. Satisfaction guaranteed or money refunded. Hermansen. 210 Fifth Ave., Suite 1102. New York 10. N. Y.

SELL & Install: Furnaces, Burners, Cabinets with Blowers. Peerless. Lincoln 6. Neb.

BOOKKEEPERS—Earn up to $520 month serving small firms part or full time. Proved plan; simplified system. Particulars free. Tax Saver System. Dept. B. Ft. Worth 2. Texas.

RELAX! While mailman brings dollars in daily mail. 10c magazine tells how. Panyko. 331 Townsend. New Brunswick. N.J.

BIG-Paying home mailorder business. Details free. Jackson. Newfoundland 4. Ky.

GROW Mushrooms. Cellar, shed. Spare, full time. We pay $3.00 pound. Free Book. Mushrooms. 2954 Admiral Way. Seattle. Washington.

MONEY now! Training course, "A Head Start in Heating, Ventilating, Air Conditioning" details special projects for immediate profits. Your own business. Full, part time. No investment or experience required. Complete with sales aids $2.00 postpaid. Harrington Institute. Box 103S. St. Mattews. Kentucky.

MAKE money addressing envelopes. Ewbank. 534 East 12th. Bartlesville. Okla.

MAKE Rubber Stamps, repair dolls, learn invisible reweaving, repair sewing machines. Catalogue of "40 Ideas." Universal. Box 1076-B. Peoria. Ill.

MONEY in new greaseless doughnuts. Start in kitchen. No smoke. Sell stores. Free recipes. S. Ray Co., 3605 South 15 Ave., Minneapolis 7. Minn.

FIGURINES unpainted, free illustrated list. Haverty Products. 822-A 17th Street. Altoona. Penna.

MAKE Perfumes At Home. Write, "Carey Laboratories". 1914 Chouteau PS-B10. St. Louis 3. Missouri.

MAILING postcards selling repeat merchandise is profitable. Everything supplied. Details free. Gordon Publishers. Box 23. Pawtucket. R. I.

WANTED—used records, 45's only. Write F-L. Box 19-S. New York City 35. N. Y.

MAKE flexible molds! Cast plaques, bookends, figurines! Free sample! H. Tooker. 630-A Chestnut. Hamilton. Ohio.

MAKE Tough, durable plastic—1c pound. Makes attractive floors, walls, built-ins, roofs. Build good home. $150.00 room. Bays Laboratory. Oklahoma City 9.

PLATING Industry needs you. Operate part time home workshop with full time profit. Our two books "Plating Lifetime Treasures For Profit" and "Modern Plating Techniques Simplified" will show you how to plate baby shoes, jewelry, silverware, novelties, and industrial products. Only $4.98 postpaid for both books. Complete line of plating assemblies, all sizes for any type plating. Use our equipment rental plan to get started with little expense. Biggest assortment of metal and onyx baby shoe mounts. Catalogs sent with books. Buy direct from world's largest and oldest manufacturers of bronzed baby shoe mountings. Hollywood Bronze Supply. Sales Department. 1624 East 1st Street. Los Angeles 33. California.

MAKE Money Addressing Envelopes! Write Malco Company. 215-PS Wilson Ave., Columbus 5. Ohio.

OPERATE Profitable mailorder business. Particulars free. George Lenhoff. Lincoln 1. Nebraska.

TYPISTS—Profitable business at home. Complete copyrighted information. 50c. Gaunt. 827-B Irving Park. Chicago 13. Ill.

EARN While You Sleep. Coin-radios. Johnny Kratz. Grantham 27. Penna.

MEN-Women—"Everybody likes Candy." Learn to make professionally at home. (Our 40th year.) Ragsdale Candies. East Orange. New Jersey.

COLORGLAZED Concrete Pottery made without molds. Patented method. Cemetery products, novelties, tiles. Basement leak-sealing. Money-making projects. Booklet, details free. Men only. National Potteries. Grand Rapids. "Minnesota."

SMALL, Inexpensive Tyco-Plater electroplates metals, mirrors, non-metals. Profitable home business or hobby. Tyco. Box 13231-CA. Houston 19. Texas.

"YOUR Phone Is Your Fortune". Send for free descriptive circular. Richard Sales. Box 675. Richmond. Va.

ELECTROPLATERS make good money. Free brochure. Joseph Kushner Electroplating School. Stroudsburg. 666. Penna.

SPARE-Time office work in your own home for Men and Women. Free details. Business Publishing House. 127-N Broad St.. Boston 10. Mass.

EXTRA Dollars. Spinning angora wool for us. Angora House. PSM. Springfield. Ill.

SAWDUST. Turn it into cash. Twenty methods. Instructions 50c. Charles Company. 12-CMA. Norwood. Ohio.

NEW Fast "Low Priced" Game of Skill. Big Profits. Details free. MO#22 Industries. Box 929. Long Beach 1. Calif.

EXPORT—Import! Represent manufacturers! Conduct barter exchange. War—peace time big business. Buy-sell by mail. Let New York experts show you "How". International Trades. 246-S Fifth Avenue. New York 1.

JOLLY'S Battery Aid. Best since 1940. Doubles life new battery. Adds to life and/or efficiency any battery in working condition. Wonderful opportunity for agents and independent service stations. Send $1.00 sample package—particulars. Jolly's Battery Aid. 240 Winfield Street. San Francisco 10. California.

INCOME from local information. No selling. Write—Neherco. La Verne 6. Calif.

UP to 11% return on over-the-counter securities. Send $3.00 for next 12 issues of only magazine on these "Hidden Value" investments, also dividend handbook. Research & Promotion. Jenkintown. Pa.

FREE 7½ lb. all-rubber personalized door mat earns you fast profit. $40 per day easy. You take orders, keep deposits! We mold in names, ship mats and collect balance from customers. Free stock name colored sample, sales plan shipped imm. Send $1 postage & handling. Write Ray Mitchell. Mitchell Rubber Co., PSM. Los Angeles 65. California.

SECURITY. $10,000.00 yearly possible. Investigate. Boyd. Fitzsimons Building. Pittsburgh 22. Penna.

FREE Booklet "How To Make Backyard Profits!" Pikett's. Florence. Kentucky.

BUY it wholesale. Manufacturers. Distributors. Over 850,000 items. Literature free. Olsen. 1231-B East Third St., Duluth 5. Minnesota.

MAKE Perfume at home—write "International". 6347 Parnell—PS-10. Chicago 21. Ill.

PROFITABLE Home Mfg. Business. Make waterless hand cleaners, household & auto specialties, etc., by simply adding water to basic concentrates. Over 300% profit, up to $500 monthly, on steady repeat orders. Western G Aircraft. Los Angeles 19.

MAKE pinecone miniature trees, ornamentals. Instructions and two, large, high-gloss cones $1.00. Winters. 222 West Grand River. Williamston. Mich.

HEATING And Ventilating—Air Conditioning Library. You save a huge 60% of publisher's price on this sensational offer —one of the most exciting we've ever made! You get the world's most complete, most lavishly illustrated, authoritative home-study course in principles, design, selection and application of Heating and Air-Conditioning Appliances and Systems for residential and commercial use . . . A Complete Library of Six big books, each indexed. Over 2,000 fact-studded pages, many hundreds of tables, charts, diagrams, photos, drawings. Easy-to-Follow "question and answer" instruction. Here's Everything you'll ever need to know to become a well-paid, top-ranking expert in this excitingly important field. All the facts, illustrated, on Blueprint Reading, Architectural Drawing, Sheet Metal Work, Insulation, Heat Losses and Gains, Thermo-Dynamics, Logarithms and Tables, Furnaces, Unit Heaters, and more! Prepared by 18 of the nation's top engineers and authorities. Our supply of these handsomely bound, silver-stamped volumes is severely limited. In all fairness, it must be "first come, first served." Big 11 lb., 6-Volume Library published at $24.80. You send only $9.98! Money back if not fully delighted. Dept. 1051-C. Popular Science. 353-4th Avenue. New York 10. N. Y.

$46 FROM Square Foot Plywood; Jigsaw necessary. Write: Woodart. Bridgewater. Massachusetts.

OPERATE profitable mail order business. Splendid opportunity. For details write. C. Wentworth Waite. 114 Lincoln Avenue. Syracuse 4. New York.

MOLDING Rubber, $2.95 qt., $9.95 gal. prepaid. Plastercraft Supply Co., 3051 St. Clair Ave., Cleveland 14. Ohio.

FREE Folio. 700 Money Making Deals. Plans, Formulas, Supply sources. Kolamite Company. Box 572. Dayton 1. Ohio.

HOMEWORK—Addressing envelopes. Details 25c. Siegal. Box 183-PS. New York 2.

MOLDS: Rubber Molds made with air-cure Latex, cast thousands of plaster statues. Literature. Major Chemical & Latex Co., 25 Allerton St., Boston 19. Mass.

SELL $2. Fire Extinguishers. Locally. Mailorder. Lorrac. Box 1086S. Albany 1. N.Y.

OPERATE Profitable Mail Order Business. Write Mac's Service. 119 Vine. Shelbyville. Indiana.

$250 WEEK reported! Free book "505 Odd, Successful Businesses." Work home! Expect something Odd! Pacific-35B. Oceanside. California.

38 MONEYMAKING OPPORTUNITIES

QUICK profits taking magazine subscriptions, handling greeting cards. Cassell Publishers Service. Westfield. N. J.

DETECTIVES Earn Big Money. Experience unnecessary. Detective Particulars free. Wagoner. P-125 West 86th. N. Y. 24.

SCHOOL Seniors—Earn sensational profits selling classmates America's Most Beautiful Graduation Name Cards. Largest selection. Outsells all others. Free sample kit. Printcraft. Dept. P. 1425 E. Elm Street. Scranton 5. Penna.

$100 UP invested 3 months pays 4½% Federally Regulated $1 opportunity booklet. Economist. Box 225. Summit. N. J.

Copyrighted material

POPULAR SCIENCE OPPORTUNITIES

BE Appointed State Notary Public Now! Details; Stationers, Helotes, Texas.

MAKE money at home. Complete instructions furnished and sample of unusual product. Easy to make. Different from other items. Cost 20c, sells for $1.00. Postage prepaid. Send $1.00 to Robert Butler, 208 Troy St., Dayton 4, Ohio.

WIN Cash, cars In Prize Contests! Write for copy filled with current Contests, winning hints and tips. Send only 30c. Wright Contest Digest, Dept. 20, P. O. Box 2266, St. Louis 6, Mo.

MAKE Money Addressing Envelopes at Home! Our information reveals how. Only 30c. Business Bureau, Dept. 45-K, Box 2224, St. Louis, Mo.

MAKE and sell an inexpensive, proven item welcomed by smokers without machinery as I do. Details 25c. Thomas Sales, Box 301-PS, Camden 1, N. J.

EARN Money Evenings, copying and duplicating comic cartoons for advertisers. Adservice, Argyle 2, Wisconsin.

WATCHES, Elgin, Waltham, other outstanding brands. Expertly reconditioned, priced low for quick, great profits! Send for Free catalog. Plymouth Jewelry 163-P Canal St., New York 13.

BIG Profits. Make fast-seller chenille monkey trees, Christmas poinsettias, Santas. Literature free. Velva, Bohemia 17, N.Y.

MANUFACTURE Rhinestone and Pearl Jewelry at home. Latest creations, tremendous profits, no skill needed. Postcard brings illustrated catalog of settings, stones, etc. A. V. Cutt Co. Inc., 210-H Fifth Ave., New York 10, New York.

PRINT without a printing press! Big Profits! See page 61.

FAST selling "magic" mirrors, easy to make. See through back. $5 for complete instructions. Further details free. Carroll Novelties, 232 Merrimon Avenue, Asheville, North Carolina.

$10,000 YEARLY possible, fantastic new demand, raise Angora Rabbits, stock furnished, production bought, literature free. Don't wait, get on ground floor. Address, Mullins & Co., Windsor, Missouri.

$250 WEEK reported! Free book "505 Odd, Successful Businesses." Work home! Expect "Odd"!! Pacific-36B, Oceanside, California.

WIN contest money. General Contest Bulletin gives hundreds of tips. List current contests and rules. Sample 25c. General Contests, 1609-A East 5th, Duluth, Minnesota.

$10,800 PROFITS At Home! Lifetime Opportunity! Free advertising method builds your own Home Mailorder Business! Capital, experience unnecessary. Start spare time. No merchandise investment! No advertising risk! Exciting; practical. Copyrighted, notarized proven successful plan 25c. Satisfaction guaranteed! Treasury, 149 Storer, New Rochelle 1-P, New York.

$$$ IN Personalized Baby Record Books. Sell By Mail Use Same Literature We Do. No-Co-Ro, Oakland 6-P, Calif.

FREE Sample copy, leading mailorder publication. Worthwhile moneymaking opportunities included. Stamp Appreciated. Variety, 57-S Circuit Ave., Newton Highlands 61, Massachusetts.

DOLLAR Maker "Tips." Ask for folder. Louis Wiltsch, Steelville, Missouri.

$100-$200 WEEKLY. No selling or manufacturing. Part or full-time. Mahaffey, 3032-A Weldon, Los Angeles 65.

WE pay you highest rates for hand-decorating greeting cards. Work at home. Experience unnecessary. Greetings, 120 Madison, Detroit 26.

MAIL Order Agency at home. Receive $3.00 orders and keep entire amount. Mail (25c) for samples & instructions. P. S. Acme, 1311 Widener Bldg., Phila. 7.

EARN extra money! Spare time. Write —D'Yarmett, 245 Church, Newark, Ohio.

PLATING outfit, refinish metal parts, no tank required, information free. Norwood Plating Co., Norwood 2, New Jersey.

ANY Formula Furnished $10.00. Lab-ert, Box 327, Tucson, Arizona.

ASSEMBLE and sell Beautiful Swiss Musical Churches. Complete Kit $3.95 P.P. Piltzecker Imports, Wood-Ridge, N. J.

WHAT you sell is free. Only cost, advertising. Plan $1.00. Meixell, Box 261, Boothwyn, Penna.

39 FORMULAS, PLANS, ETC.

FORMULAS, trade secrets, for nearly everything. Catalog free. Creative Publishers, Winnetka 7, Illinois.

FORMULAS—All kinds. Latest products. Literature free. Kemico, Park Ridge 15, Ill.

FORMULAS for big-profit, fast-selling products. Free literature. Majestic, 530½ S. Main, Elkhart, Indiana.

LABORATORY tested formulas. Lists free. Pont, Box 635-PS, Terre Haute, Ind.

FREE formula Catalog. Anything analyzed $25.00. Western Chemical, Salem, Oregon.

40 PLASTICS

LUCITE, Plexiglas. Any size sheets masked Square foot (12 x 12) cost 1/16" $1.20; ⅛", $1.40; 3/16", $1.75; ¼", $2.08. Include 10% postage. Almac Plastics, 230 Fifth Avenue, New York 1, New York.

HI-Profits—Gifts—Jewelry—Free catalogue, details. Pilot Plastics, 67-B Fulton St., New York City 38.

PLASTIC Sheets, Rods, Tubes, etc. Free List. Plastic Supply Co., 2901 N. Grand Blvd., St. Louis 7, Mo.

NEW liquid plastic. Clear, colors. Cast without heat. Embed flowers, insects, coins. Saw, drill, carve. Send 25c for Wholesale Catalog and New Sales Manual showing how to make money at home. Castolite, Dept. L-102, Woodstock, Illinois.

LUCITE, Plexiglas, acetate; casting, molding plastics, findings. Dye manufacturer. Quantity prices. Special bargain lots. Immediate shipment. Complete catalog 10c. 25c airmailed. Gem-O'-Lite, Box 6864, North Hollywood, Calif.

REPAIR False Teeth with Flint-lok! New sensational self hardening dental plastic. Generous supply handles twelve repairs. Outfit complete with instructions only $5.00. Grant Dental Laboratory, 219 W. 7th St., Los Angeles 14, California.

PLASTICRAFTERS supplies wholesale. Literature 20c. Cosmopolitan, Box 176-PS, New York 8, N. Y.

41 CHEMICALS & APPARATUS

NEW Idea Chemical and Apparatus Outfits for Home Experimenting. Photo-Scales, Microscopes, Chemicals, Biological and Laboratory Supplies in Small Quantities. Catalog 25c. Established 1931. John H. Winn, 124-B West 23rd Street, New York 11, N. Y.

LUMINOUS Paints will glow in dark. Six colors. Fairmount Chemical Co., 136 Liberty St., New York City 6.

LABORATORY Apparatus, Chemicals, Microscopes, Complete Chemistry Sets, Minerals, Uranium Ore. 10c brings catalog. Porter Chemical Company, Hagerstown 2, Maryland.

SPECTROSCOPE for quick chemical analysis $3.00. Cutting Sons, Los Altos, Cal.

ILLUSTRATED Catalog: Chemistry, mineralogy, biology, 10c. Tracey Laboratories, Evanston, Illinois.

LEARN Chemical Analysis, complete kits with instructions. Catalog 15c. B. & S. Amateur Chemist Supply, 191-49 115 Ave., St. Albans 12, New York.

CATALOG of chemicals, apparatus, kits, minerals, Uranium ore. 10c. Rex Laboratories, 2849-B Birchwood, Chicago 45, Ill.

CHEMICAL supplies Catalog 15c, refundable. Laboratory Sales, Box 161, Brighton, Mass.

OH Boy! New Book Of Science, Experiments, Formulas, Secret Processes, together with Catalogue of Laboratory Supplies, only 25c. National Scientific Company, Dept. 15, 2204 North Avenue, Chicago 47, Illinois.

CHEMICALS and apparatus for industrial, analytical, and private laboratories. Catalog 15c. Dept. M-26, Biological Supply Co., 1176 Mt. Hope Ave., Rochester 20, N.Y.

25 DIFFERENT Chemicals. Ounce quantities $2.95. Al. Ginsberg, 43 Amboy St., Brooklyn 12, New York.

42 HELP WANTED

FOREIGN & Latin American Employment. 1951 "Foreign Service Directory" gives Up-To-Minute Facts on Military & Civilian Construction, Government Jobs, Major Oil Listings, Aviation, Transportation, Steamship Lines, Mining, Importers, Exporters, How-When-Where to apply, application forms, Hot List Firms Hiring. $1.00 post-paid. Global Reports, P.O. Box 883-S, Hollywood 28, Calif.

FOREIGN Employment Construction men, building trades, helpers, office men, others, interested in Foreign Projects. High wages, quarters, trans. Listings of firms actively working on U. S., Foreign, Intercontinental Projects. Send $1 for Foreign Construction Compendium and Application Forms. Foreign Service Bureau, Dept. PS-10, Box 295, Metuchen, New Jersey. (Not an employment agency—no fees.)

ENJOY Tremendous Profits selling Christmas Displays. Annual cleanup for hustlers. Literature Free. AdPro, Box 592-PS, Springfield, Ill.

HAWAIIAN Employment? Complete list sugar pineapple plantations employing 20,000. Send $1.00. Employer's Directory, #3 Campbell Block, Honolulu, Hawaii.

$1,000,000 CONSTRUCTION Projects, "World Wide" printed Monthly Foreign & Domestic employment. Free application blanks tells How-When-Where to apply. $1.00 complete. Global Reports, P.O. Box 883-PX, Hollywood 28, California.

43 AGENTS WANTED

NEW Jobs open in selling! Send name, address for five free issues of Opportunity Magazine's money-making guide, listing hundreds of companies who'll pay you well, full or part-time. No experience needed. Opportunity, 28 E. Jackson, Dept. 18, Chicago 4, Illinois.

DRESSES 18c; Coats $2.00; Blouses 35c; Free Catalogue; Crown, 164-PB, Monroe Street, New York 2.

MAKE Wedding Profits. Sell invitations, napkins, matches. Samples free. Dunbar's, Middlebush 5, N. J.

AGENTS—300% profit selling genuine gold window letters; stores and offices. Free samples. Metallic Letter Co., 437 N. Clark, Chicago.

COMMERCIAL Deep Frying Course. Mock Chicken Legs, Potatoes. New and proven methods. Learn about this money-making field. $2.50. PP. Concession, Toledo 13, Ohio.

PHOTO-Salesmen-Agents. Sell beautiful hand colored plastic enlargements and sensational new photo compacts, rings, bracelets, lockets, etc. Collect deposit, we deliver. Profitable sideline. Send card, for Free sample kit. Novel Portrait Co., 3343-A North Ave., Chicago, Ill.

NEED Extra Cash? Take orders for personal initialed belts and buckles, cap badges, tie holders, etc. Choice of 3000 emblems. Free sales kit. Hook-Fast, Dept. 1425PS, Providence, R. I.

NYLON Uniforms. Immediate delivery, immediate profits. Free sales kit. Superior Fabrics, Dept. A-10, 3936 Market, Philadelphia 4, Pennsylvania.

JUST Out! New thrilling sensation in Christmas cards. Make big money! Show lustre foils, satins, brilliants. Amazing values bring easy orders! Christmas cards with name 50 for $1.25 up. Also imprinted book matches, stationery, many gifts. Get 30 Free Samples with name; several $1 boxes on approval. Joy Greetings, 507 N. Cardinal, Dept. M-61, St. Louis 3, Mo.

START Your Own Business on credit. Always your own boss. 1,437 Dealers sold $5,000 to $28,500 in 1950; their average $6,704. We supply stocks, equipment on credit. 200 home necessities. Selling experience unnecessary to start. Wonderful opportunity to own pleasant, profitable business backed by world-wide industry. Write Rawleigh's, Dept. J-U-PSC, Freeport, Ill.

FREE Samples, and amazing plan, giving you gorgeous Dress without penny cost. Rush name today, with dress size. Harford, Dept. E-435, Cincinnati 25, Ohio.

Copyrighted material

POPULAR SCIENCE OPPORTUNITIES

ANYONE can sell Hoover DuPont Nylon Uniforms for beauty shops, waitresses, doctors, nurses, others. In white and colors. Exclusive styles. Top quality. Low priced. Exceptional income. Real future. Equipment free. Write fully. Hoover, Dept. S-101, New York 11, N. Y.

AT Last! Something new and sensational in Christmas cards. Make extra money fast! Show gorgeous satins, velours, metallics never before offered. Gets easy orders! Pays up to 100% cash profit. Free Samples 30 Christmas cards with name, 50 for $1.25 up. 80 assortments. Personalized book matches and stationery, gifts. Several $1.00 boxes on approval. Write Puro Co., 2801 Locust, Dept. 141-M, St. Louis, Mo.

IS $210. a week worth a penny postcard to you? Then rush card with name and address for special Free Trial Plan that sells amazing new Automatic Refrigerator Defroster "like hot cakes!" Write to Mr. Lewis, D-Frost-O-Matic Corp., Dept. PSC-10, 6 N. Michigan, Chicago 2, Ill.

DO you need money? $35.00 is yours for selling only 50 boxes of our 300 Christmas Card line. This can be done in a single day. Free samples. Other leading boxes on approval. Many surprise items. Experience unnecessary. Free samples Personalized Christmas Cards, Stationery, Napkins. Write today. It costs nothing to try. Cheerful Card Co., 373 White Plains, N. Y.

CHRISTMAS Cards At Jobbers Prices! Large selection dollar assortments 35c each in hundred lots. Imprint Cards, Money Folders, Gift Cards, Pictures, etc. Make more profits selling our line! Catalog free! Three sample boxes $1.00. Elfco, 438 North Wells, Chicago 10.

BRAND New! Amazingly different and smart Christmas cards bring you big money! Take easy orders fast. Pays up to 100% cash profit. Christmas cards with name 50 for $1.25, up. Big line. Personal stationery and book matches. Get sample assortments on approval, imprints Free. Write today. North Star, 31 Glenwood, Dept. 19-A, Minneapolis, Minn.

FREE Merchandise to new customers ($1.50 retail value—your selection). Sensational "get acquainted" offer. Rush 25c for Illustrated Wholesale Bargain Catalog and Free Merchandise certificate. Save up to 50% on 2,000 everyday necessities and novelties. Reliable Jobbers, 311-J North Desplaines, Chicago 6.

MAKE money selling ties. Free catalog. Write to Philip's Neckwear, Dept. 830, 20 West 22 St., New York.

300% PROFIT—Postage stamp photos from negatives or prints, perforated sheet form, gummed backs. Free details, samples. National Photostamp Co., 1418-F Third Ave., New York 28.

BE A Money Maker . . . Represent magazines year around. Wonderful home work. Big Christmas profits now. Liberal commissions. Everything furnished. Write for Free catalog. McGregor Magazine Agency, Dept. 510A, Mount Morris, Ill.

SHINE Shoes Without "Polish." New invention. Lightning seller. Shoes gleam like mirror. Samples sent on trial. Kristee 135, Akron, Ohio.

GOLD Lacquered and Silver Sign Letters. Windows. Doors. Trucks. Standard sizes. Penny each. Free samples. Atlas-G, 544 West 79th, Chicago 20.

ABSOLUTELY Free! Big package actual sample fabrics and style presentation of dresses, lingerie, hosiery, etc. Take orders. Commissions big. Send no money. Melville Co., Dept. 6315, Cincinnati 25, Ohio.

OWN A Big Moneymaking New and Used Clothing Business. Men's used suits $2.00, pants 35c, topcoats $1.25. Jackets 60c, shoes 20c. No experience necessary. Free wholesale catalog. Superior, 1250-B Jefferson, Chicago 7.

NEW Plastic Mending Tape. Just press on! Repairs clothing instantly. Lightning seller. Samples sent on trial. Kristee 134, Akron, Ohio.

SENSATIONAL money maker—washable woolen slacks, skirts, shirts—plaids and solid colors. Nationally advertised "Sanforlan" label. Nylon reinforced, childrens, teen-age. Terrific repeat business. Bonus Plan. Start immediately. Free Sales Kit. Wash-Em, Westport 23, Conn.

HI-Profits—Gifts—Jewelry—Free catalogue, details. Pilot Plastics, 67-B2 Fulton St., New York City 38.

WHERE to Buy 800,000 articles direct from Manufacturers. Save by buying direct. Sent Free. "Your Profits Under The Spotlight." Glass Pub. Co., Ellwood City 4, Pennsylvania.

I'LL Put A "Shoe Store Business" In Your Pocket! Nation's Leader trains you to make Big Money! Fit men, women. Free Sample Outfit—Write Today! Consolidated Shoe System, Dept. 335-F20, Chippewa Falls, Wisconsin.

CALENDARS, Advertising Novelties, Matches. All styles, including Religious. Varnished, 12 Sheet, Girls, Hundreds of Advertising Novelties, Book Matches, etc. Fleming Calendar Co., 6539 Cottage Grove, Chicago 37, Illinois.

BIG Daily Profits—selling embroidered wool and cotton uniforms, initialed buckles, belts, badges, choice 3,000 emblems. Free sales kit. Hook-Fast, Box 480PS, Roanoke, Va.

SHUFFLE, Pin Game, factory direct. Mazuma! Webb Distributing, 4966 West Chicago Ave., Chicago 51, Ill.

MAKE Extra Xmas Money In Your Own wholesale business. Write for our Free illustrated wholesale catalog listing gifts, watches, jewelry, premiums and toys at prices below the wholesale market. Distributors to the trade for twenty years. We accept sample orders. Write today! O. Faust, 223 N. 8th Street, Dept. PS-1051, Phila. 6, Penna.

WHY Lug Heavy Cases? Carry samples of Efficiency Cards in pocket. Earn to $35.00 daily, spare time. Dealers, jobbers, manufacturers, drug, hardware stores need 'em. Reasonably priced, good commissions. Samples, details to sincerely interested over 21. Write today Efficiency Products, Hawthorne, New Jersey.

BIG Profits In Spare Time! I'll send Free Assortment Full-Size Samples fine foods, household necessities to ambitious Men—Women who need money. Friends, neighbors buy eagerly. Send no money. Just write Blair, Dept. 55GT, Lynchburg, Va.

BUY wholesale 25,000 items, catalogue 25c. Matthews, 1472-A3 Broadway, N.Y.C.

SUPER liquid mender fixes most anything, including wood, metal, glass, fabrics. Tube, 35c postpaid. AA, 2216 Mobile, Chicago 39, Ill.

ULTRA-Blue Stock Signs—7c. Sell 35c. 2,000 slogans. 7"x11", comedy, religious, general. 15 samples, $1.00. Lowy, 812-ST Broadway, New York 3.

HOW would you like to get paid for "giving away" first quality nylon stockings at 49c? That's all they cost if they run within guarantee period to three months! Advance cash—big bonus. No experience needed. Just write orders. We deliver—collect. Postcard brings you free sample stocking and sales outfit prepaid. Kendex Corp., Babylon 14, New York.

SALESMEN, Distributors, fast selling costume jewelry direct from factory. Big picture catalog free. Pickcraft, C-19 Bank, Attleboro, Massachusetts.

SELL nylons! No experience, no money needed. Highest commissions. Lowest prices. Highest quality. Money back guarantee. Write for free sales kit. Lido Hosiery Mills, 149 Church Street, Dept. F-1, New York.

AMAZING easy earnings. Make $3.00 to $5.00 an hour spare time. Show friends, neighbors our new sight-selling Christmas. Everyday cards, wrappings, stationery, gift items. Also get extra bonuses and valuable merchandise prizes. Send today for 30 Free imprint samples and boxes on approval, with complete instructions. Prompt service. Bob-Art Greetings, Dept. L-112, 278 Washington Ave., Chelsea 50, Mass.

SALESMEN, Money-making sideline. Calendars and Advertising Specialties. Highest commissions advanced. Free New Cars. Rush name. Advertising Specialty Manufacturing Co., Brooklyn 36, N. Y.

FALL Sales. Self-propelled rotary mowers, 20"-32". Cuts everything. Farm Products-PS, Excelsior Springs, Missouri.

SELL only 50 boxes of Xmas Cards & Sure $35 is Yours! Sell to friends, neighbors, churches, clubs, etc. in Spare or Full Time. Big, beautiful line includes Wraps, children's cards & books, novelties, name imprinted Xmas cards, religious & regular boxes. Sells 50 for $1.25 & up. Stationery, napkins, matches with name-on. Over 100 numbers. Costs nothing to try. Write For Free Samples On Approval. Rainbow Cards, 38-H E. 1st St., New York City 3, N.Y.

RAT-Deth (cheese flavored). Local franchise. Sell big users. Farm Products-RD, Excelsior Springs, Missouri.

MEXICAN feather pictures. Sell on sight; 200% profit! Free details; sample 10c stamps. Sylvia-SQ, Apartado 9036, Mexico City.

SELL Big Money-Maker to Men and Women. Easy handwork makes fast-selling useful articles. Sample free. Sunmade Company, Brockton 64, Mass.

BUY Wholesale thousands nationally advertised products at big discount. Sent free "The Wholesale Plan." American Buyers' Service, 629-T Linden, Buffalo, N. Y.

PRINTING — Salesbooks — Envelopes — tags. Free illustrated catalog. Ersco, Bronx 61, New York.

FREE — "Bookalogues!" Novelties! Money-makers! "Police Jiu-Jitsu." 50c! Hirsch, Spring Valley 3, New York.

BE Our Catalog Representative. Contains household, TV, general Merchandise items. We supply everything free, no expense for you. Write: Teleron Company, 41-05 Lawrence, Flushing 55D, New York.

BARGAINS!! Save up to 50%. Balloons, combs, novelties, notions. Carleton House, (PSM), Texas City, Texas.

BELOW Wholesale. Watches, Jewelry, Appliances, Premiums, Silverware, Cookware. Collins Co., Forsyth 2, Georgia.

FREE book "505 Odd, Successful Businesses." Work Home! Expect something Odd! Pacific-34B, Oceanside, Calif.

SELL new clothing. Lowest Prices. Operate from home, auto, store. Enormous Profits. Big Catalog Free. S&N, 605-D 12th Place, Chicago 7.

A A A. Sensational Talking Christmas & Birthday Cards. Pull tape and card clearly says "Merry Christmas." 150% profit. Retails 25c. Sample 25c, five for $1.00 with wholesale prices. Minas, P. O. Box 18214-R, Los Angeles 33, Calif.

NICKEL Silver key checks—Key check stamping Outfits. Catalog free. General Products, 11PS No. Pearl, Albany, N. Y.

EXTRA money quick. Sell "NuSilver Polish and Plating Liquids". Cloth applied. Particulars free. NuSilver, 508-PS10, New York St., Aurora, Ill.

44 HIGH-GRADE SALESMEN

MAKE Money with famous, easy-selling Bostonian shirts—spare time, full time, sideline. Fabrics, outfit Free. Bostonian, 89 Bickford, Dept. G-11, Boston 30, Mass.

EARN Big Money Fast! Sell finest-quality advertising work uniforms to garages, factories, filling stations, etc. Free selling kit. Topps, Dept. 5410, Rochester, Indiana.

ADVERTISING book matches—Cash in on big demand—sell Union Label matches. Cuts for all businesses and political parties—Free powerhouse selling kit—low prices—protection guaranteed on repeat orders—Cash commissions. Superior Match Co., Dept. P-1051, 7530 Greenwood, Chicago.

MAKE money showing neighbors how to beautify yards with glorious flowering shrubs and trees. Quick-bearing Dwarf fruit trees; World-Famous Stark Patented Varieties produce abundant harvests champion-quality apples, pears, peaches, other fruits. Even small plots produce fruit for family-use and to sell. Beautiful Sales Kit Free. Stark Bro's., Dept. 30102, Louisiana, Missouri.

AD Matches! Sell Amazing Designs—20, 30, 40 and 240-light book matches. Biggest spot cash commissions; every business a prospect. Low prices for high quality. Repeats. Start without experience; men, women; full, part time. Buy Nothing! Sales kit furnished. Match Corp., Dept. PS-22, Chicago 32, Illinois.

Copyrighted material

UP to $50.00 in a week spare time and tailored suit for yourself without paying one cent. Write for plan and Free Sample Case. Pioneer Tailoring Co., Congress & Throop St., Dept. Y-1121, Chicago 7, Ill.

"PENSILUBE" New scientific lubricating pencil for home, shop, office. Salesmen write Reardon Products, Peoria, Illinois.

SELL Advertising Specialties and Executive Gifts for old established firm. Good thing for man with wide acquaintance among business firms. Opportunity for hustler who likes to make money and isn't afraid to make calls. Develop your own business with no investment. Leads given after you are established. Best selling season now on. Write today. Newton Mfg. Co., Dept. PS, Newton, Iowa.

A Pair Of Shoes As Bonus. Big money making shoe line. Men's, women's dress, work shoes and boots. Newest Spring-Step Cushion construction. Lighter, softer, longer wearing, lower price. Ortho-Vent, S-1051, Salem, Virginia.

WANT to make real money? You can positively make $50.00 a day and up selling a brand new item going to every type of food and beverage store, factories, Laboratories, Hospitals, etc. First time advertised. Write for Free Details today. Johnson-Hartman, 53 West Jackson Blvd., Dept. PS-10, Chicago 4, Illinois.

45 EDUCATIONAL & INSTRUCTION

USED Correspondence Courses and Books sold and rented. Money back guarantee. Catalog free. (Courses Bought). Lee Mountain, Pisgah, Alabama.

HIGH School—No Classes. Study at home. Spare time. Diploma awarded. Write for Free catalog HBA-6, Wayne School, 2527 N. Sheffield, Chicago 14, Ill.

BOOKKEEPERS! Increase your earnings! Operate your own simplified "Dollar-A-Week" Bookkeeping and Tax Service. Full or spare time. Details Free. No obligation. Ellis, Box 203, Cedar Grove, N. C.

START a Collection Agency business. Very profitable. Quickly learned. Write Cole & Associates, Syracuse 2, N. Y.

PIANO Tuning Pays. Learn this profitable profession at home. Our Tonometer and mechanical aids make learning easy. No knowledge music necessary. Diploma granted. Largest and oldest school—51st year. G. I. Approved. Write for booklet. Niles Bryant School, 77 Bryant Bldg., Washington 16, D. C.

$200 WEEKLY Reported! No selling. Free booklet. T. J. Surface, Roanoke 4, Va.

MEDICAL Laboratory Technicians in great demand. We train you in your own home. Catalogue free. Imperial Technical Institute, Box 973-B, Austin, Texas.

LEARN Tailoring in one of America's finest tailoring schools. Write book 10. Empire Institute of Tailoring, 422 East 5th, Hazleton, Pa.

BECOME a Doctor of Psychology or Metaphysics. Teach secret of contentment, happiness. Win degree of PsD. or MsD. Solve mental worries. Free book. College of Universal Truth, 5153-K N. Clark, Chicago.

LEARN Piano Tuning, Repairing—at home in 30 days. Unlimited income. Phonograph recordings, tools and instructions furnished. Write Capitol City Tuning School, Department C-1033, 129 East Michigan, Lansing 16, Michigan.

EVERLASTING Life. The long awaited desire of man to find scientific proof of eternal life is fulfilled. Stated in simple practical language of electomagnetic physics which opens new fields of endeavor and leading to ultimate instrumental communication. Send $1.00 today for your introductory copy, postpaid. Timely Publishers, 911 So. First St., Yakima, Wash.

LEARN Auctioneering at home working with successful auctioneer. Revolutionary method provides classroom training in spare time. $100,000 daily often earned by trained auctioneers. Advance Auction School, 5944 North Newark, Dept. 204, Chicago 31.

MIDLAND Linotype School, Charles City, Iowa. Civilian, Veteran courses. Free placement.

PRACTICAL Nursing—Learn Easily at Home. Spare Time. Big demand, good earnings. High School not necessary. Write for free facts. Wayne School, Dept. FH-3, 2525 Sheffield, Chicago 14, Ill.

USED Correspondence Courses and Educational Books Bought, Sold, Rented. Catalog Free. Educational Exchange, Summerville, Georgia.

U. S. Gov't Jobs! Men—Women. 50,000 jobs open now! Start high as $66.34 week. Experience usually unnecessary. Can you qualify? Get Free 32-page book—showing jobs, salaries, requirements, sample tests. Write: Franklin Institute, Dept. B-22, Rochester, New York.

STOP forgetting. Good memory pays. Newly discovered method brings amazing results. Memory Institute, Box 261-S, Staten Island 1, N. Y.

WELDING training pays at Hobart Welding School, Box P-1012 Troy, Ohio. VA Contract. Best equipment. Catalog Free.

INCREDIBLE! Unprecedented! Look under "Personal!" Bijou, Box 1727-VG, Hollywood 28, Calif.

WAKE Up your winning ability. Activate your idle success powers. End money worries. Get ahead. Enjoy living. New thought-control Behavior-Mastery method gets results in every case or no cost. Details sent free. School of Personal Psychology, Tenth Floor, Washington Bldg., Louisville 2, Ky.

ALGEBRA, Trigonometry, Calculus. Individualized instruction. Free details. New Correspondence School. Box 27, St. Johns, Brooklyn 13, New York.

BOOKKEEPERS! Read, "What you should know about a bookkeeping service", 25c. James, Box 1281, Lubbock, Texas.

SCIENCE of memory amazingly simplified. New book. Information free. Memorology Studio, 2016-S Sunnyside, Chicago 25, Illinois.

HAIRCUT as you like it. Booklet tells how 25c. Mastrolia, 5½-BC, Jane, New York City 14.

COCKTAIL Lounge Bartending and Management. Home study or School Training. American Bartending School, P-334 S. Wabash Avenue, Chicago 4, Illinois.

EARN $50.00 daily, home or office. Rush season coming. Details Free. Universal, Box 664-P, Springfield, Missouri.

FOR as little as $8.00 you can put your ad here in the December issue. Get in on the Christmas mail-order rush and deliver your sales talk direct to the 3,992,000 readers of Popular Science. Special classification "Christmas Gifts"—available for this issue. Same low rate you've always paid—80c a word. The December issue closes on October 25th! Write today for order blank and free booklet, "How To Make Money Out of Classified Advertising." O. K. Kelly, Classified Advertising Manager, Popular Science Monthly, Dept. B, 353 Fourth Avenue, New York 10, New York.

47 DETECTIVES

DETECTIVES—Work home—Travel. Experience unnecessary. Detective Particulars free. Write, Wagoner, P-125 West 86th, New York 24.

SECRET Service, fingerprint training at home, in spare time. Write, Associated Special Investigators, Box 474, Saint John, N.B., Canada.

48 LANGUAGE OUTFITS

LISTEN and Learn A Language by Linguaphone. At home, quickly, easily, correctly master Spanish, French, German, Russian, Asiatic—any of 29 languages through Linguaphone Conversational Method. Add to service, job, travel opportunities. Send for Free book. Approved for Veterans' Training. Linguaphone Institute, 5410 Rockefeller Plaza, N.Y.C.

50 BUSINESS SERVICE, INFORMATION, NAME LISTS

MAILORDER Operators! 1,000% profit selling "No Risk Radio Advertising" plan! 400 broadcasters; commission basis! Exciting details, 15c. Herbert Simon, 59 Park Avenue, New York City 16.

MAILING Lists. All kinds 1000 $5.00. Dixie Service, King, N. Carolina.

RAISE Capital for any legitimate business proposition under the Ideal System. What's your problem? Tucker, Business Service, 3633 Warder St., N.W., Washington 10, D. C.

13,000 NAMES College Teachers, $10.00. Lynch List, 402-APC Hazlett, Baltimore.

51 SPECIAL SERVICES

ARTIFICIAL Eyes. The world's finest true-to-life artificial eyes of plastic. Won't break, roughen, or discolor. Send old, well-fitting-eye even though cracked and discolored. I will make one exactly like it in plastic. $25.00. Money-back guarantee. Dr. H. R. Patrick, D.D.S., 406-A Whitehead Bldg., Atlanta, Ga.

SILVERPLATING special. Creamer & Sugar $7.50. We do all metal plating. Send to Dresden Silverplaters, 957 E. Jefferson, Detroit 7, Mich.

52 AUTHORS SERVICE

"TEN Steps To Writing Success" reveals How you can write stories, poems, articles for publication. Details Free. Will Herwell, 7016 Euclid, Cleveland 3, Ohio.

I Want New Writers. Experience unnecessary. Earn at home, spare time. Details Free. Saunders M. Cummings, 468-15 Independence Bldg., Colorado Springs, Colo.

53 ADVERTISING

ADVERTISE: 24 words, 40 Newspapers. $3.50. Lists Free. Advertising Bureau, 10511-P Springfield, Chicago 43.

24 WORDS in 50 Weeklies, $4.96. H. J. Darnell, 730 Hays, Jackson, Tennessee.

ADVERTISE: 40 Texas Weeklies, $3.50 (24 Words). M. Pennebaker, Kerrville, Tex.

54 CARTOONING, SIGN PAINTING, CHALK TALKS

"HOW To Make Money With Simple Cartoons"—A book everyone who likes to draw should have. It is free; no obligation. Simply address Cartoonists' Exchange, Dept. 1910-C, Pleasant Hill, Ohio.

BE smart. Get in Art. Let me start you Free. Nick Nichols Arts, PS, 39 West Adams, Chicago, Illinois.

YOUR Cartoon drawn by an experienced cartoonist. Send Photo and 25c to Cartoonist, Newtown, Conn.

BARGAINS on Famous Art Courses, Moneymakers for Amateurs, etc. Literature free. National Artists, Dept. C, 801 North Marsalis, Dallas 8, Texas.

CHALK Talks. Laugh Producing Program. $1.00. Illustrated Catalog 10c. Cartoonist Balda, Oshkosh, Wisconsin.

SIGNS increase sales economically. We make 'em! Most any kind. $1.00 up. Postal brings suggestions and prices free. Or send us your requirements. Signpost, 200 Mardick Rd., Richmond 24, Virginia.

55 TYPEWRITERS & OFFICE MACHINES

PRINTOMATIC selffeeding Post Card printing Duplicator $15.75. Envelope Addressing Machines $24.50. Pittsburgh Typewriter Company, 336-G Fourth Avenue, Pittsburgh 22, Pa.

TYPEWRITERS, Printing Devices, Office Machines supplies appliances. Dixie Graph, King, N. Carolina.

56 RUBBER STAMPS & OFFICE SUPPLIES

THREE line Rubber Stamp with stamp pad metal case hinged lid $1.00. 4 lines $1.25. Anderson, Box 855, Mountain Home, Tennessee.

3 LINES 50c; Pads 35c; Signatures $2.00. Printright, Wauwatosa, Wisconsin.

SUPERIOR Rubber Stamp, three lines, $1.00; one, 40c. Pad, 40c; dater, 75c. 50-50 imprinted stationery, $1.00. Catalogue. Prompt service! Johnson Press, Box 6-B, New York City 26.

PICTORIAL rubber stamps (sample, 1" star, 50c). Stampico, 8833 Quincy, Detroit 4, Mich.

57 PRINTING, MULTIGRAPHING, ETC.

PRINT without a printing press! Big Profits! See page 61.

Copyrighted material

BUSINESS Printing. Samples, prices free. Howprint, 723-S Eunice, Webster Groves 19, Missouri.

1000 BUSINESS Cards $2.50 Prepaid samples Free. Reliable Print Shop. 905 East Jefferson, Louisville 6, Ky.

PRINTING—Small lots specialty. Save money. Free samples, price list. Bonnie Vale Press, Laconia, New Hampshire.

QUALITY Printing. Booklets, publications, circulars, stationery. Free price list. Adams, 30 West Washington, Chicago 2, Ill.

PHOTO-offset Printing. 10,000 (5½x8½) Bond paper, black ink—$22.50. Abell Press, 6751-3rd Avenue, Brooklyn 20, N. Y.

FREE samples, prices. Quality work, postpaid. Fast service. Sutton Printing, 341 State, Waycross, Georgia.

ECONOMICAL printing. Free prices and wholesale offer. Bosserman, PS10, 4047 Westway, Toledo 12, Ohio.

100 8½x11 LETTERHEADS $1.00 Postpaid. Envelopes same. Race Printing, Hudson, New York.

BUSINESS Stationery. Small lots. Samples free. Mero Products, 99 Morrison, Punxsutawney, Penna.

58 PRINTING OUTFITS, SUPPLIES

PRINT your own cards, stationery, circulars, advertising. Save money. Simple rules. Print for others, nice profit. Raised printing like engraving too. Have home shop. Details free. Kelsey Presses, L-8, Meriden, Connecticut.

PRINTING Presses, Type Supplies. Lists 3c. Turnbaugh Service, Loysville, Penna.

MAKE Your Own rubber printing cuts. Self-molding process. Plexirubber, Argyle 2, Wisconsin.

PRESSES, Supplies, Paper, catalog 10c. Custom, Box 211-S, Springfield, Missouri.

59 PATENT ATTORNEYS

INVENTORS: Write for free brochure "Evidence of Invention." Labiner, World Building, New York 7.

"INVENTOR'S Guide" free. Frank B. Ledermann, Registered Patent Attorney, 154 Nassau Street, New York.

INVENTORS. For "Invention Record" form, contact Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

C. A. Snow & Co.—S-427, Snow Building, Washington 1, D. C. Registered Patent Attorneys. Write for information.

INVENTORS—If you believe you have an invention, we can make a preliminary search on your invention and advise you whether we think it can be patented. Send for copy of our Patent Booklet "How to Protect Your Invention" and "Invention Record" form. No obligation. McMorrow, Berman & Davidson, Registered Patent Attorneys, 1433 Victor Building, Washington 1, D. C.

PATENT Protection—This well-known organization will send you promptly upon request and without obligation, a booklet containing detailed information concerning steps to take to protect your invention by a United States Patent. Victor J. Evans & Co., Merlin M. Evans, Registered Patent Attorney, 641-L Merlin Building, Washington 6, D. C.

DAVID Charness, Patent Attorney, 11340 Sunset Blvd., Los Angeles 49, Calif.

PATENTS—Irving L. McCathran, 316 McLachlen Bldg., Washington 1, D. C. Registered Patent Attorney.

INVENTORS: Learn how to protect your invention. Unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and prepared to serve you in handling your patent matters. "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure with "Record of Invention" form will be forwarded to you upon request—without obligation. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 12B-K District National Building, Washington, D. C.

INVENTORS: When you are satisfied that you have invented something of value write me, without obligation, for information as to what steps you should take to secure a Patent. Write Patrick D. Beavers (Formerly Randolph & Beavers) Registered Patent Atty., 938 Columbian Bldg., Washington 1, D. C.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent. John N. Randolph, Registered Patent Attorney, 207 Columbian Bldg., Washington 1, D. C.

60 FOR INVENTORS

SEARCHES—Put your patent searches in the hands of a Registered Patent Attorney or Agent, as he qualifies to give a worthwhile patentability report. Record of Invention form upon request and information on patent protection. Patrick D. Beavers, Registered Patent Attorney, 939 Columbian Bldg., Washington 1, D. C.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent on your invention. John N. Randolph, Registered Patent Attorney, 206 Columbian Bldg., Washington 1, D. C.

CASH For your idea, 280 manufacturers need inventions, patented or unpatented. List free. Invention Bureau, 208-S Clinton, Oak Park, Illinois.

INVENTORS. For "Invention Record" form, contact Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

INVENTORS: If you have an invention for sale, patented or unpatented, write Institute of American Inventors, Dept. 30A, 631-E St., N.W., Washington 6, D. C.

INVENTIONS Promoted, Patented or Unpatented. Established 1911. Write Adam Fisher Company, 183 Enright, St. Louis, Missouri.

INVENTORS—If you believe you have an invention, we can make a preliminary search on your invention and advise you whether we think it can be patented. Send for copy of our Patent Booklet "How to Protect Your Invention" and "Invention Record" form. No obligation. McMorrow, Berman & Davidson, Registered Patent Attorneys, 1432 Victor Building, Washington 1, D. C.

INVENTORS—If your consider your invention to be something of importance, take steps to protect it with a United States Patent which gives you the right to exclude others from making, using and selling your invention as claimed. "Patent Protection for Inventors" outlines steps to take to secure patent protection. Mailed promptly without obligation. Victor J. Evans & Co., Merlin M. Evans, Registered Patent Attorney, 642-L Merlin Building, Washington 6, D. C.

INVENTORS: Learn how to protect your invention. Unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and prepared to serve you in handling your patent matters. "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure with "Record of Invention" form will be forwarded to you upon request—without obligation. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 12A-K District National Building, Washington, D. C.

PATENT Searches, $5.00, including patent copies. Same reliable search as conducted for patent attorneys. Free protection forms, 48 hour service. Patent Service Institute, 945-B Pennsylvania Avenue, Washington 4, D. C.

PATENT Searches $5.00, including copies of closest patents. Same reliable searches we conduct for Patent Attorneys. 48 hour Airmail Service. "Record of Invention" free. Capitol Patent Service, Box 664-S, Washington 4, D. C.

IF you have a new idea, development or invention get an expert appraisal and opinion before you spend hundreds of dollars. Over 25,000 inventions screened and reviewed. Write for details or send $3.50 with complete information. Marketing Bureau, Gables Building, Evanston, Illinois.

INVENTORS: Obtain patents without assistance. Save time and money. Eliminate the unofficial disclosure of your invention. Complete, simplified instruction manual, including directions for making your own patent search at home, $3.50. An invaluable asset to every inventor. Order your copy today. Examine five days, if not satisfied, return for prompt refund. International Patent Library, Post Office Box 7412, Washington 5, D. C.

DEVELOPED drawings, engineering, designing, of inventions. Confidential. Cost estimates without obligation. Adamec & Bednar, 55 W. 42nd St., Rm. 212-A, New York 18, New York.

PATENT Searches $5.00, 48-hour service. Patent Applications and Drawings prepared. Protection forms free. Write Miss Ann Hastings, Patent Searcher, P.O. Box 176, Washington 4, D.C.

PUBLICIZE your inventions! 78 National Magazines—51 Million Circulation! Details, 25c. "78-A Simon", 59 Park Avenue, New York City 16.

INVENTIONS promoted patented, unpatented. Complete services. M. Joyce Humphries, 1425 Landtitle, Philadelphia 10.

GET your own patent! Easy! Cheap! Secretly! Patent forms furnished. Write Rankin Legal Forms, Lock Box 202S, Gary, Indiana.

61 INVENTIONS WANTED

INVENTORS: Hundreds of manufacturers have requested our assistance in locating marketable new products. Complete information, free. Institute of American Inventors, Dept. 30C, 631—E Street, N.W., Washington 4, D. C.

INVENTORS—What have you, patented, patent pending available for manufacturers? Booklet mailed free. Address: Market Contacting & Date Service, 11106-B2 Longwood, Chicago 43.

INVENTIONS Promoted, Patented or Unpatented. Established 1911. Write Adam Fisher Company, 183 Enright, St. Louis, Missouri.

CASH or royalty for your invention. We provide this opportunity. Free details. Inventors Patent Exchange, Inc., Dept. D, Hartford 1, Conn.

CAPITAL, Manufacturing, Sales Facilities Available. G & M Company, Traffic Station, Box G, Minneapolis 3, Minnesota.

INVENTIONS Wanted. Patented or Unpatented. 20 years experience Promoting Inventions. National Service Bureau, 3132 Meramec, St. Louis 18, Missouri.

63 MANUFACTURING

ANYTHING made of sheet metal, odd fittings heating, ventilating ducts. Henry Stein, Grape Street, Pittsburgh 10.

64 MODELS, MODEL SUPPLIES

SHIP and Yacht model fittings; blueprints. Send 25c for illustrated catalog No. 26—Listing hundreds of items. A. J. Fisher, 1002-2 Etowah, Royal Oak, Mich.

SHIP Models—most complete line in New England. Kits, parts, plans, books, tools. Engines, motors. New illustrated catalog, 25c. James Bliss & Co., Inc., 220 State St., Boston, Mass.

BUILD Historic ship models, complete kits, 50c to $9. Catalog 15c. Ideal Models, 21 West 18th, New York 11, N. Y.

SHIP Model and yacht supplies, complete large 64 page catalogue, 30c. Wm. Wild, 510 E. 11th St., New York City.

STEAM engines, boilers, castings. Catalog 25c. Anton Bohaboy, 2297 Price, Rahway, New Jersey.

MOST complete stock, H.O. Trains, Boats, Airplanes on Coast. Mail anywhere. Try us. "Hobby Craft", The Bon Marche, Seattle 1, Washington.

65 HOME CRAFTSMAN

90 All new, full size lawn ornament and novelty patterns, up to 20" high. Only $1.00. Mastercraft 102S, 7041 Olcott, Chicago 31, Illinois.

LEATHER, tools, lacing, supplies. Free Catalog. National Handicraft, 199 William St., New York 7.

Copyrighted material

POPULAR SCIENCE OPPORTUNITIES

TURN your spare time into cash. Make quick-selling, highly profitable lamps—every home a prospect. No experience or special tools required. New 1951 56-page illustrated catalog shows shades, shade frames, figurines and bases, oil lamp converters, boring compounds, and dozens of similar items. Also all kinds of sockets, cords, pipes, harps, finials, bases, and hundreds of other parts—everything you need. Special 8-page section shows 6 beautiful lamps in kit form ready to assemble. You buy wholesale, sell at retail—make big profits. Hundreds doing it. You can, too. Send 25c today for catalog and wholesale price list. Refundable first order. Gearon Co., Dept. 500-A10, 27 S. Desplaines, Chicago 6, Illinois.

OUR biggest Leather and Craft Catalog yet! 1000's of items. Send 25c (refunded with 1st order). Russo Handicraft Supplies, Dept. O-9, 245 S. Spring, Los Angeles, California.

MAKE leather belts, billfolds, purses. Big catalog and genuine steerhide keyholder, 10c. Tandy Leather, Box 397D, Tulsa, Okla.

MAKE, Sell, Artificial Flowers, Corsages, Chenille Dolls, Jewelry, Starting kits, Woodfibre, Leaves, Shellcraft, Rhinestones, Sequins, Findings, Wholesale Profitcraft Catalog, 10c. Cleveland Models, 4507TC102 Lorain, Cleveland 2, Ohio.

FREE book "Practical Painting, Wood Finishing" shows how to get professional results. Furniture finishing, workshop projects, home decorating. Complete Modern brush and spray methods. Tricks you've never seen. It's Free! Write Home Craftsman, 115-F Worth St., New York 13.

LEATHERCRAFT For Pleasure or Profit. Make easy-to-assemble purses, belts, gloves, woolskin toys, 100 other items for gifts or to sell. Send 10c today for big catalog. Largest Leathercraft stock in U. S. J. C. Larson Co., 820 S. Tripp, Dept. 1276, Chicago 24.

DOWELS made Easy, Fast on Wood Lathe. Complete details $1.00. Fowlers, 1412 11th St., Charleston, Ill.

CHERRY chests, chairs, tables, stools, wall racks, miniatures. For you to assemble, finish. Catalog. Eby Reproductions Co., 106, Paradise, Penna.

BANDSAW, Jigsaw owners, let your machine bring extra profits, fun. Free details. Nu-Art, Dept. A, Box 2235, Boston, Mass.

89 FULL size Jig Saw patterns of beautiful shelves, ornaments, toys, novelties. Plus "How, Where to Sell." Only $1.00. Mastercraft 104S, 7041 Olcott, Chicago 31, Illinois.

VIOLINMAKERS: Amateurs—Professionals. Fine tone European wood, materials, supplies. Illustrated catalogue 10c refunded. Premier Violin Supplies, 430 S. Broadway, Los Angeles 13, Calif.

100 FULL size jig saw patterns up to 20" high, only $1.00. Pattern Service, Medway 8, Massachusetts.

PRINT without a printing press! Big Profits! See page 61.

LEATHERCRAFT Tools, Leather Embossing Plates, Craft Accessories, Dies. Catalogue 10c. Louis Jones Engineering Company, 1613 Main, Fort Worth, Texas.

NEW items needed for mail order sales. Bigham, Brooker, Florida.

LEATHERCRAFT Tools, Lacings. H. Byrd, 3406 Montrose Avenue, Richmond, Virginia.

LEATHERCRAFT supplies catalog. Pleasure and profit. New style handbag patterns, belts. Leathercraft school G.I. approved. 25c for catalog (Refund 1st order). Dept. PS, Apache Leather Co., 2804 E. Washington St., Phoenix, Arizona.

ALABASTER—Homecrafters. Now you can have something new and beautiful that can be worked on the Lathe, or carved with ordinary woodworking chisels. Write for information and price list. Alabaster Sales, 423 S.W. 23rd St., Oklahoma City 9, Oklahoma.

LEATHERCRAFTERS! Everything for the leathercrafter, large illustrated catalog 10c. Art Leather, 411 Joseph Ave., Rochester 5, New York.

80 FULL sized patterns Lawn Ornaments, Toys, Novelties $1.00. Modern Woodcraft, Saginaw, Mich.

LEATHERCRAFTERS—metal ornaments—buckles—pocketbook accessories. Cosmopolitan Metalcrafters, Box 176-B, New York 8.

LEATHERCRAFT, Copper tooling, textile painting, many other crafts. Big free catalog shows everything you need. Kit Kraft, 7377 Melrose, Hollywood 46, Calif.

PROFESSIONAL type furniture finishing and refinishing supplies. Beautiful new, complete, illustrated catalog and complete simplified instruction manual 25c. Colorall, Dept. S, 515 Cedar Lane, Teaneck, N. J.

LEATHER. Send only one dollar for pound assortment of fine glove leathers! Get pieces in assorted colors, shapes, sizes! Wonderful for leathercraft, ornamentation, patching! Bridgeco, Northville, New York.

SOMETHING new. Log cabin Bank. Easy to make. Nice Christmas presents for kiddies or grown ups. Send $1.00 for sample. Robert Butler, 208 Troy St., Dayton 4, O.

LEATHER—assorted colors. Ideal for purses, billfolds, box coverings, guaranteed weights. Make wonderful gifts. 6 lbs.—$3.50 ppd.—10 lbs.—$5.75 ppd. Jumbo box 20 lbs. only $11.00 ppd. Order now. No C.O.D.'s. Leather Crafters, Box 412-P, Evanston, Illinois.

FOR as little as $8.00 you can put your ad here in the December issue. Get in on the Christmas mail-order rush and deliver your sales talk direct to the 3,992,000 readers of Popular Science. Special classification "Christmas Gifts"—available for this issue. Same low rate you've always paid—80c a word. The December issue closes on October 25th! Write today for order blank and free booklet, "How To Make Money Out of Classified Advertising." O. K. Kelly, Classified Advertising Manager, Popular Science Monthly, Dept. B, 353 Fourth Avenue, New York 10, New York.

66 BUILD IT YOURSELF

BUILD Your Own "Tractor". Free information. Eltraco D-5, Camptonville, Calif.

STREAMLINED, Built-in Kitchen cabinets to fit any kitchen. Illustrated manual describes designing and construction. All for $1.00. Thombert Company, Newton 11, Iowa.

"CONCRETE Block Homes." 32 Page booklet on how to build, $1.00. Other Home Building booklets, $1.00. H. C. Lightfoot, Civil Engineer, Richboro, Penna.

GRANDFATHER clock building made easy. Shoptested plans Spirit Century narrow waist or stately straight side Spirit America, dollar—both plans dollar fifty. Kuempel Clox, Minneapolis 16.

FREE Handbook, build sawmills, block machines, freezers, tractors, scooters, 250 shop, farm, home machines. Nichols Co., Dept. C-1100, Purvis, Miss.

WOODEN circular saw, adjustable cut, portable. Save ¾. Plans $2.00. MW Utilities, 706 Avenue U, Brooklyn.

67 OLD GOLD, JEWELRY, WATCHES, ETC.

NEW catalog lists over 5,000 styles! Gold plated jewelry supplies, Rhinestones, Pearls, etc. Complete details, only 10c. Barry's 47-12 Branford Place, Newark 2, N.J.

HIGHEST Cash Paid For old, Broken Jewelry, Gold Teeth, Watches, Silverware, Diamonds, Spectacles, Platinum. Free information. Satisfaction Guaranteed. Rose Smelting Company, 29-Y East Madison, Chicago.

RHINESTONES, jewelry settings, cameos, sequins, beads. Catalog Free. J & M Novelties, Dept. CL-4, Griffith, Ind.

WRIST Watches, New, guaranteed, Jeweled Swiss movement $7.35. Moran McKinless, Towson 4, Maryland.

CASH air-mailed for Old or Broken Jewelry, Gold Teeth, Watches, Silver, Platinum, Diamonds. Mail articles or write for Shipping Container. Satisfaction guaranteed. Chicago Jewelry Exchange, 6236PS South Mozart St., Chicago 29, Ill.

ASSEMBLE rhinestone jewelry. Introductory assortment $1.00—Montague, Box 746, Wilmington, Delaware.

JEWELRY Making Catalog. Milady-Fair Co., 35 Maiden Lane, New York City 38.

GOLD plated Jewelry Supplies, Rhinestones, Moonstones, Pearls, catalogue 10c. Hobby Shop, 99 Prospect St., Paterson, N. J.

FOR as little as $8.00 you can put your ad here in the December issue. Get in on the Christmas mail-order rush and deliver your sales talk direct to the 3,992,000 readers of Popular Science. Special classification "Christmas Gifts"—available for this issue. Same low rate you've always paid—80c a word. The December issue closes on October 25th! Write today for order blank and free booklet, "How To Make Money Out of Classified Advertising." O. K. Kelly, Classified Advertising Manager, Popular Science Monthly, Dept. B, 353 Fourth Avenue, New York 10, New York.

68 TOBACCO & PIPES

ROLL 200 pleasingly mild cigarettes for 75c, particulars free. Pete Moberly, Box 841, Owensboro, Kentucky.

69 FOR THE HOME

CESSPOOL trouble? Use Peps-It. Rejuvenates fermentation action, saves pumping costs, deodorizes, reduces masses. Costs only $2.50. Safe. Sanitary. Free descriptive literature. Chemical Cesspool Cleaning Co., Boston 34, Mass.

WATER Softeners. Buy direct from factory, save money. Write for price list. Shursoft Water Softener Co., 4242 W. Lisbon Ave., Milwaukee 8, Wisc.

MAGNETIC knife and tool rack. Details free. Willard's, Canoga Park, Calif.

70 OF INTEREST TO WOMEN

START Profitable Sparetime Business Making Artificial Flowers, woodfibre, corsages, chenille dolls, shellcraft, rhinestone jewelry, novelties. Starting kits, materials. Wholesale Profitcraft Catalog, Business Plan, 10c. Cleveland Models, 4507TC103 Lorain, Cleveland 2, Ohio.

VENETIAN Blind tape. Plastic or Cotton 30c yard. Free color chart. Moore, B461, Kittanning, Pa.

71 FOR SALE MISCELLANEOUS

DRESSES 18c; Coats $2.00; Blouses 35c. Free Catalogue. Crown, 164-PS Monroe Street, New York 2.

COMPLETE Stocks Foam Rubber. All types, sizes and thicknesses! Hurry, write for price list. AMC Supply, P.O. Box 1440, Fort Worth, Texas.

CIGARS. Fine. Mild. Factory fresh. 10c size. Two boxes of 50 $5.00. Postpaid. Or four trial cigars send quarter. Money back guarantee. L. Burr Cigar Factory, 5516 Easton, St. Louis 12, Missouri.

TYPEWRITERS $22.50, Duplicators $12.50; Typewriters, 118 North Spruce, Wichita 7, Kansas.

OIL Painting, canvas, of yourself or loved one from photograph or snapshot. Ideal gift. Extremely low price. I. Pescatori, Box 1049, Church St. Station, New York 8.

72 WANTED MISCELLANEOUS

SCRAP Mercury (Quicksilver) Tantalum—Bismuth—Tungsten. Metallurgical Products Co. Established 1909, 35th & Moore Sts., Philadelphia 45, Pa.

SCRAP Platinum—any shape or form. Will pay, at present, $75.00 per troy oz. (Price subject to market conditions). Metallurgical Products Company. Est. 1909, 35th & Moore Sts., Philadelphia 45, Pa.

WANTED Best prices for Air Tools, Riveters, Nut Runners, Squeezes, Drills, etc. Any quantity. Write-Wire-Phone. The Tool House, 1617A North Broadway, Wichita, Kan.

MERCURY—Highest prices. Free Containers. Write Mercury Terminal, Norwood, Mass.

73 WEARING APPAREL

WORK Shirts. Only 79c. Save! See ad on Pg. 69. Young Products, 2605 Elmhurst, Detroit 6, Mich.

Copyrighted material

75 TATTOOING SUPPLIES

TATTOOING Outfits. Supplies. Illustrated List Free. Zeiss. 728 Lesley. Rockford, Illinois.

76 DRAWING, SUPPLIES & EQUIPMENT

DRAFTING and artists' materials catalog—thousands of items—25c (deductible first $2 order). Gordon's. 219 Madison. Chicago.

DRAWING Instrument Catalogue 20 pages description and Illustrations. Write for free copy. V. & E. Manufacturing Co., Box 950N, Pasadena 20, Calif.

77 TREASURE FINDERS

TREASURE Hunters! New 11-pound featherweight Model 101 locator for gold, silver and minerals. Money-back guarantee best available. Also Geiger Counters for uranium prospectors. Complete information free. The Goldak Company. 1540 W. Glenoaks Blvd., Glendale 1. Calif.

GOLD, Silver, Metal Detectors. Geiger Counters for Uranium. Mineralights. Sensational new fully guaranteed models. None Finer. Information Free. Detectron Co., 5631 Cahuenga Blvd., North Hollywood. California.

SELECTIVE Metal & Mineral Detector. Highly sensitive. Revolutionary new design. Write for literature. Gardiner Electronics Co., Dept. 20, 2018 N. Dayton, Phoenxi, Ariz.

TREASURE—M-Scope Geiger Counters —Mineral Locators. Why buy something inferior when you can buy the best at a lower price? Backed by years of experience. Fully guaranteed by factory. Detects minerals, metals, gold, silver, coins. Payment plan available. Proven superior performance. Free 16 page illustrated booklet. Fisher Research Lab., Inc., Palo Alto. Calif.

GEIGER Counter. Complete, $29.75. uses one flashlight battery each year of use. Morgan Instruments Co., 21420—C Valerio. Canoga Park. California.

INSTRUCTIONS for building Radio Treasure Finder, $1.00. Wyss, 104½ Frances, St. Joseph, Missouri.

78 WATCH REPAIRING

WATCHES Completely Repaired: $3.50. Guaranteed; Berkowitz. 1265 Olmstead Ave., Bronx 61. N. Y.

"THE Modern Clock". All about clock repair. 502 pages. 173 illustrations. $4.95 postpaid. 10-day return privilege. North American. Dept. 21K. 2018 North Avenue. Chicago 47. Ill.

WATCHMAKERS' complete informative catalogue 20c deductible. Bengal Company, Culver City. Calif.

WATCHMAKERS' Journal contains helpful hints on watch repairing. $1.00 year. Sample copy 20c. Dean Co., Box 3218. Daytona Beach. Fla.

WATCHMAKERS Tools. Materials. Supplies. Repairs Catalog. Gales. Box 1000. Chicago 90. Ill.

79 MISCELLANEOUS

CAN You Make $40.00 A Week, typing at home, in your spare time? Write Hood's. Kannapolis 11, North Carolina. (Enclose stamped, addressed envelope).

DRESSES 18c; Coats $2.00; Blouses 35c. Free Catalogue. Crown, 164-PC Monroe Street. N. Y. 2.

YOUR Leather Jacket renovated expertly. Free circular. Berlew Mfg. Co., Dept. 7. Freeport. N. Y.

OUTDOOR Toilets. Cesspools. Septic Tanks cleaned, deodorized with amazing new product. Just mix dry powder with water; pour into toilet. Safe. no poisons. Save digging, pumping costs. Postcard brings free details. Burson Laboratories. Dept. E-53. Chicago 22. Illinois.

RECEIVE Giant Mails. magazines. catalogs! Three months 25c, year 50c. Waddell's Directory, 341-D East 76th. New York 21.

"HAND-Me-Wipe" Waterless, cleans hands better. Write, Colony DanceWax, Davenport, Iowa.

KENTUCKY'S caves. 8 colored post cards $ .25. Fred Rowe. Horse Cave. Kentucky.

PANNING Gold lesson—Catalogue Beginners supplies, Mining Books, Maps, "Where To Go". Free. Old Prospector, Box 729D2. Lodi. Calif.

INTERESTING folder free. Letters remailed. Books. Pictures. Stamp collections: Grabbag 30c. Sell-out lot $1.00. Box 48. Brooklyn 25. New York.

SWISS Musical Church miniature, snow-covered. Plays "Silent Night" when door opens. Builds family tradition. $7.50 postpaid. Kit form to assemble $5.95. M. A. Sales. Livermore. Iowa.

WIDE Shoes For Men! E to EEEE only. Money back guarantee. Free catalog. Hitchcock Shoes. 2089 Hingham. Mass.

BIG Mails Three Month. 25c year Name Listed Directory $1.00. Harvey Teeple. Decatur. Indiana.

MINERAL—Treasure Locators—Geiger Counters. Superior performance. lowest prices. Payment plan available. Free literature. Fisher Research Lab., Inc., Palo Alto. California.

SOURCES of Supply. 50c each. Kelly. 9544-A Whitcomb. Detroit 27. Michigan.

SEEK Gold, Uranium, Buried Treasure. Latest low cost super-sensitive equipment. Free literature. Glen Scientific, Box 151-D. Glen Ellyn. Illinois.

HYPNOTIZE Men. Women and Children. Complete, illustrated, step-by-step course. Formerly closely guarded secrets exposed by noted hypnotist! Lesson sixteen explains his method of hypnotizing subjects instantly!—and against their will! Only $1.00. David Bishop. 299 Broadway. New York 7.

FOR as little as $8.00 you can put your ad here in the December issue. Get in on the Christmas mail-order rush and deliver your sales talk direct to the 3,992,000 readers of Popular Science. Special classification "Christmas Gifts"—available for this issue. Same low rate you've always paid—80c a word. The December issue closes on October 25th! Write today for order blank and free booklet. "How To Make Money Out of Classified Advertising." O. K. Kelly. Classified Advertising Manager. Popular Science Monthly. Dept. B. 353 Fourth Avenue. New York 10. New York.

80 PERSONAL

"HOW Can I Find Out?" You Can! Information discreetly developed. Any matter. person. problem. anywhere. Worldwide. Officially licensed. bonded service. Established 1922. Reasonable. Confidential. William Herman. 170 Broadway. N. Y.

BROOKLYN letters remailed 25c each. Barth. 6611 Cooper. Brooklyn 27. N. Y.

GOLDEN Gate—Letters mailed 25c each. Caswell. 1252 16th Avenue. San Francisco. California.

BORROW by mail. Loans $50 to $300 to employed men and women. Easy. quick. Completely confidential. No endorsers. Repay in convenient monthly payments. Details free in plain envelope. Give occupation. State Finance Co.. 210 State Finance Bldg.. Dept. D-14. Des Moines 8. Iowa.

PSORIASIS Sufferers: Has everything failed to bring even temporary relief from scales. lesions and itching? Then write today for Free important information. You needn't invest one cent! Pixacol Company. Box 7097-S. Cleveland. Ohio.

FRANCE. Germany. Switzerland Remail. 3 letters $1.00. Stamps free. Calvin Paige. Hauptpostlag. Basel 1. Switzerland.

DETECTIVE'S Opportunities. Detective Particulars free. Write. Wagoner. P-125 West 86th. New York 24.

CONFIDENTIAL information for single people, leading to happiness, romance. Write today! Dr. K. Miles. B.S., M.S., Ph.D., Human Relations Counselor. 601-G South Vermont. Los Angeles 5. Calif.

IF you are nervous, write The Herbmaster. Forestville 8. Virginia.

FREE exciting letter information. J. P. Literature Publications. Box 106. Brooklyn 27. New York.

FOR Security And Peace use my New Interpretation of the Lord's Prayer. "Whatsoever ye shall ask in my name, that will I do; If ye shall ask anything in my name, I will do it." (John 14.) Prove to yourself that prayer can be effective. "Then thou shalt make thy way prosperous, and then thou shalt have good success." (Joshua 1.) Send One Dollar for this New Prayer today. Carl Oscar, Box 820. Chicago 90. Ill.

ADMINISTRATIVE potential? Write Vocational Testing Center, 2227 DeLancey. Philadelphia 3. Penna.

SAN FRANCISCO—Your address, mail forwarded, outgoing letters remailed, $3. Mo. TBS Co., 742 Market St., S. F.

"INTERESTING Mails"—25c keeps your mail box full three months. Bentz, Desk-D/91. Chatawa. Mississippi.

SAVE your Hair. Registered Pharmacist offers time tested formula. Checks falling hair. dandruff. scalp itch. Details write S. Viggiano, 6556 Ladson. Pittsburgh 6. Pa.

PRINT without a printing press! Big Profits! See page 61.

INCREDIBLE! Unprecedented! Become a mental superman overnight! Floor everybody! No studying! 'Memoprop' does all your thinking! It's uncanny! Revolutionary! Write: Bijou. Box 1727-VG. Hollywood 28. California.

MEXICAN Law. General Practice Attorney. 1203 Arizona Street. El Paso. Texas.

PERSONAL problems analyzed; correspondence or conference. Please anticipate delay. August Cesare. Box 755. Youngstown. Ohio.

INFORMATION for single people by Human Relations Consultant. Dr. B. Long. Box 375. Los Angeles 53. Calif.

SUCCESS Simplified! Become a financial wizard; a mental giant; an athletic Superman; a romantic magnet; an expert in any field! Free literature. Success Society of America. Box 5852. Cleveland 1. Ohio.

SECRET of Persuasion. $1.00. Dubois. 880 Churchill Rd.. T.M.R. Montreal 16. Can.

KNOCK Out that overhang. No drugs. Quick pick up. No after effects. Inexpensive. Formula $1.00. C. G. Blair. 2230 Lumpkin Rd.. Augusta. Georgia.

STOP Snoring Scientifically. E. Hamilton's Easy Way Booklet $1.00. Box 509. Kenosha. Wisconsin.

OPPORTUNITY extraordinary for limited number physically-handicapped people to receive extra income for life. Request free factual brochure "Winning Profit From a New Enterprise". Watts Service, 3837 Chestnut St.. Kansas City 3. Mo.

MANUFACTURER to you, sixteen vitamins and ten minerals in one tablet, retailing nineteen dollars, your cost five dollars. hundred. W. H. Laboratories. 614 N. La Peer Dr.. Los Angeles 46. Calif.

"HOW to Regain Health With Proper Food Courses." Joseph Piantanida. 2128 Van Ness Ave.. San Francisco 9. Calif.

CONFIDENTIAL information for single persons. Copyrighted literature explains future happiness. Mailed Free upon request. Strone. Box 157-PS. New York 11.

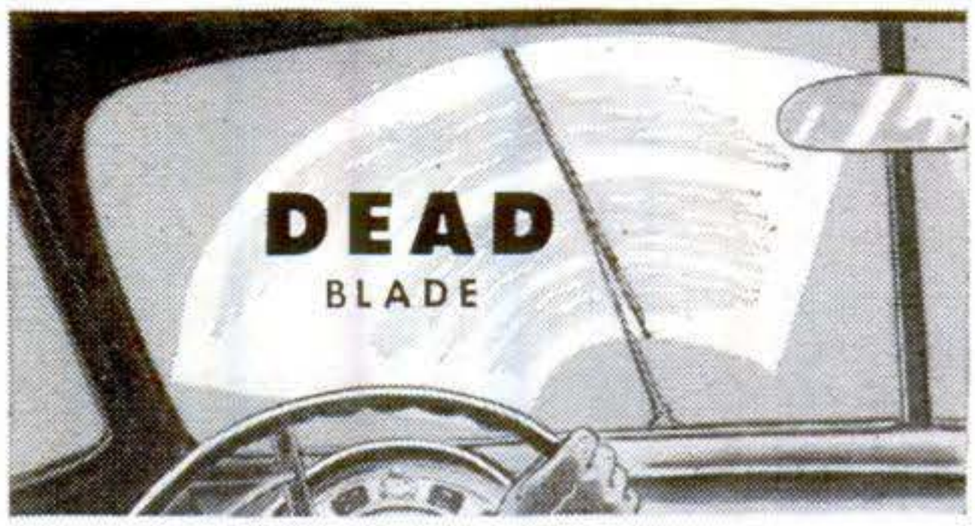
PILES! Tormented with the irritation and discomfort due to piles? Write for free important information. Mutal Products. Box 836-P. Cleveland 22. Ohio.

REJUVENATION; self-toning method; A Must for men. Revelation. Alfafla. 2606-P University Place. Washington. D. C.

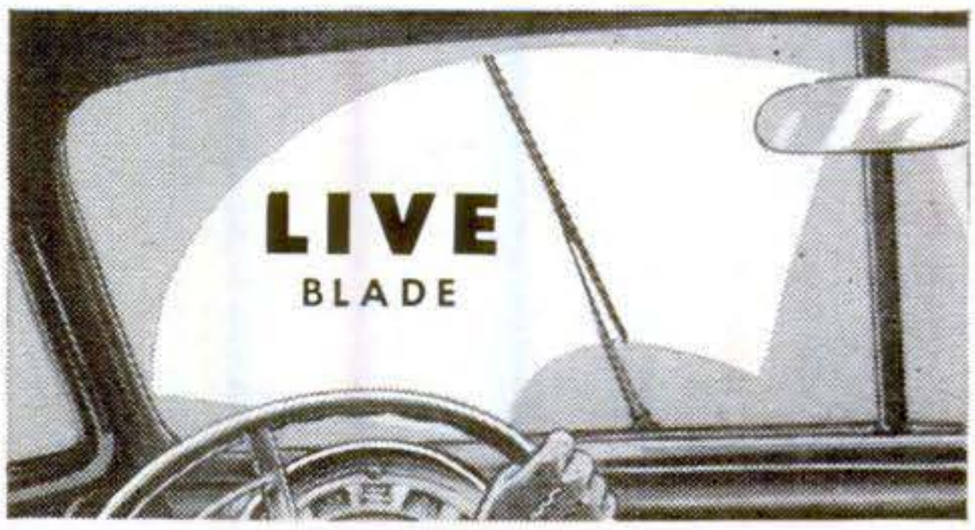
FOR as little as $8.00 you can put your ad here in the December issue. Get in on the Christmas mail-order rush and deliver your sales talk direct to the 3,992,000 readers of Popular Science. Special classification "Christmas Gifts"—available for this issue. Same low rate you've always paid—80c a word. The December issue closes on October 25th! Write today for order blank and free booklet. "How To Make Money Out of Classified Advertising." O. K. Kelly. Classified Advertising Manager. Popular Science Monthly. Dept. B. 353 Fourth Avenue. New York 10. New York.

Copyrighted material

DEAD BLADES MAKE DEAD DRIVERS



THIS DEAD WIPER BLADE still may look okay but it streaks glass dangerously. DEAD blades make DEAD drivers!



THIS LIVE ANCO BLADE wipes clean . . . clears rain . . . clears muck . . . lets you SEE. Protects you and your loved ones from smashups.

Get Live New ANCO Blades . . .

Fit Your Car Quickly . . . At More than 260,000 Service Stations

Even the best wiper rubber goes dead . . . from exposure . . . often in six months or less. Don't be a Dead Blade Driver. Don't risk facing criminal negligence charges, after a needless storm-bred smashup, with dead blades found on your car.

Come Clean! Replace at once your Dead wiper blades with LIVE new ANCO Blades. They are best for most miles of quicker, cleaner wiping. Get yours today.

ANCO RAIN-MASTER model for Flat windshields. Fits all cars. World's largest selling replacement blade.

ANCO CLEAR-FLEX model for Flat or Curved windshields. Fits all cars having Curved windshields . . . best for Flat windshields, too.

THE ANDERSON COMPANY
Gary, Indiana, U.S.A.

PORTABLE GARAGE

USE IT ANYWHERE!

$10.95 (Extra Heavy Gauge)

• Goes wherever your car goes • Takes little room • Keeps rain, snow, dust, salt air, sun or sleet away & protects your car's finish • Durably constructed of clear transparent—heavy gauge vinyl plastic that is long wearing and tough • Spring-tite elacticized bottom, holds securely in all kinds of weather • Fits all makes and models • Direct from manufacturer • $10.95 • 10 Day Money Back Guarantee.

Enclose check or money order, or sent C.O.D.

DOMAR SALES CO., 480 LEXINGTON AVE.,
DEPT. GP-4—New York 17, N. Y.

Build your own *JET ENGINE!*

Order these plans today

1. JET PROPELLED BICYCLE. Assemble your own. Photo and instructions $1.00.
2. HOW TO MAKE EXPERIMENTAL JET ENGINES. Seven sheets drawings with information and instructions $2.95.
3. BOTH OF ABOVE in one order $3.75.

SEND NO MONEY. Order both at once $3.75 C.O.D. in USA plus c.o.d. postage. Send check or Money Order and we pay postage. Get other information too. Rush Order.

J. HOUSTON MAUPIN, Dept. 66, Tipp City, Ohio

Authenticast MINIATURES 1" to 108"

These are the same official scale models used in recognition and pre-combat training by our government

Send for Complete New Catalogue 25¢

COMET METAL PRODUCTS CO., INC.
Richmond Hill 18, N. Y.

Reduce RADIO NOISES

SIMPLY PLUG Radio or Appliance cord into Noise Eliminator and plug into wall socket. Enjoy reception FREE from many distracting noises. Send No Money, pay postman **$1.25** each (**2 for $2.00**) plus postage or send cash and we'll mail postpaid. Try 5 days, money back if not delighted. Many hundreds of satisfied users. Send for yours today.

$1.25 EA — 2 for $2.00

MERIT SALES, Dept. T-29
6560 Sheridan Rd. Chicago 26, Ill.

REAL LEATHER *NAVY* HELMET

NO HOOKS, TUBES OR HOLES

Brand new NAVY helmet of rich Cordovan Brown leather lined with soft warm fleece. Detachable chin strap. Ideal for flyers, cyclists, farmers, hunters. Children love them! Cost Gov't. $10.00. Small, medium, large sizes. Send cash, chk. 25% dep. plus postage on COD. Money back guarantee. . . . . **$2.00 pp.**

GRAND-HAWTHORNE SURPLUS
1439 S.E. Grand, Dept. PS10-51, Portland, Ore.

"It Measures As It Rolls"

ROLLER RULE

HANDY MECHANICAL PENCIL

$1.29 POST PAID

Measures Curves and Straight Lines. Any Shape. Any Distance. Any Surface.

Roll head over surface. Inches and fractions record accurately on "Inch-O-Meter". Excellent pencil too! Order Now! **10 Day Money Back Guarantee!** C.O.D. (postage extra). In Calif. add 3% Sales Tax.

PENCIL SALES CO., Dept. PS-10
Room 6, 1213 E. Ocean Blvd., Long Beach, California

Copyrighted material

Live Better FOR LESS MONEY

THIS NEW *Free* BOOK TELLS HOW!

Learn how you can enjoy the comfort and privacy of a home of your own... a modern, convenient and *satisfying* way of life that you CAN afford for

BUDGET LIVING **NEW JOB LOCATION**
MILITARY LIVING **GETTING MARRIED**
RETIREMENT OR VACATION

Send today for the new free book covering ALL the above needs. State which interests you most. Schult, the "old reliable" of the business, has up-to-date answers for YOU. Address Dept. 3110.

SCHULT

Leaders in Mobile Homes

SCHULT CORP. ELKHART INDIANA

BELL RE-CORD-O-*fone*

three-speed tape recorder

for Professional or Home Use

Model RT-65-B

Up to four hours of recording on 7″ reel

Now, everyone can enjoy all the business advantages —plus entertainment—of modern tape recording. With a speed selection for any type recording this moderate priced RE-CORD-O-fone assures you of professional results for conferences, sales meetings, speech classes, and other business uses. At home, you can record radio programs or phono records you'd like to preserve, make sound tracks for home movies, or use at parties. Plugs in any AC wall receptacle. Records two tracks on standard tape . . . and tape can be "erased" and used again and again. Comes in handy carrying case, with instruction manual . . . ready to use! Over-all size only 15″ wide, 16″ long, 8½″ high. Weighs only 33 pounds.

WRITE TODAY FOR BULLETIN AND PRICE

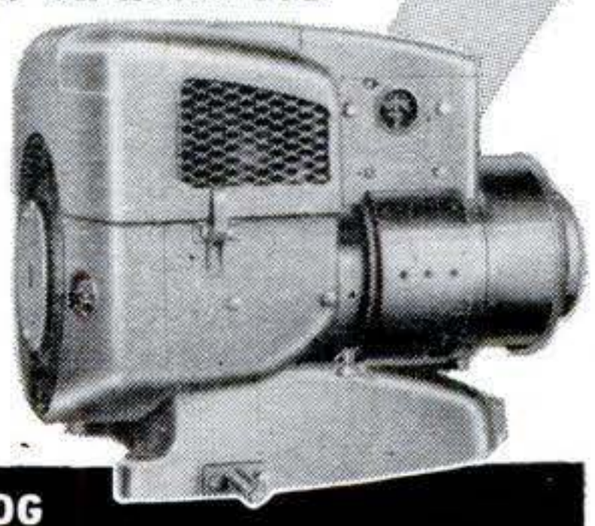
BELL SOUND SYSTEMS

BELL SOUND SYSTEMS, INC.
564 Marion Rd., Columbus 7, Ohio

ELECTRICITY *Anywhere*

FOR PORTABLE, EMERGENCY OR HOME USE

ONAN Electric Plants generate 110-volt, 60-cycle current for homes, farms, cabins and resorts beyond the highline. Lightweight, portable plants cut costs, speed work for contractors. Standby plants protect hospitals, homes, civil defense units against power failure. 400 to 55,000 watts. Gasoline or Diesel-powered. Priced from $219.00.



WRITE FOR CATALOG

D. W. ONAN & SONS INC.
6732 ROYALSTON AVE. • MINNEAPOLIS 5, MINN.

WHAT FEATURES DO YOU WANT IN AN AIR GUN?

- LONG 10″ BARREL... FOR HIGHEST ACCURACY (On Single-Shot & Repeater models)
- REPEATER MECHANISM... FASTER, EASIER SHOOTING (On 6-Shot Repeater model)
- INTERCHANGEABLE BARRELS.. SHOOT 5 TYPES OF AMMO, PELLETS, DARTS, BBs (On Sportster model)

• ILLUS. 6-SHOT REPEATER MODEL

At Your Dealer, Or Write For Booklet
HY-SCORE ARMS CORP.
25 Lafayette St., Bklyn. 1, N.Y.

NO PERMIT REQUIRED

FELLAR YOU WANT **HY-SCORE**
THE ONLY AIR GUN WITH SO MANY EXCLUSIVE FEATURES!

AMAZING VALUE! FLEXIBLE SUN VISOR

KILLS SNOW AND HEADLIGHT GLARE!

Approved by
Police, Safety Bureaus, Insurance Companies, Truck Drivers. Perfect for anyone who wants comfort and safety while driving.
Recommended by Julius Young!

ONLY 1.95 STOPS HEADLIGHT GLARE

Once you've tried this on your car, you'll never want to drive again without one. Scientifically formulated to filter out ultra-violet and infra-red rays, it gives you cooler riding comfort . . . with unrestricted vision. Rush your order TODAY. Save money on this special Mail-Order Price!

FREE 10-DAY TRIAL

- **Adheres securely to inside of windshield**
- **Stops glare without reducing vision**
- **Like looking through fine sun-glasses**
- **Eliminates driver fatigue, headlight glare**
- **No tools—No screws—No Bolts—No glues**

SEND NO MONEY

Just send us your name and address. We ship immediately. Pay Postman 1.95 plus postage. Or, send cash, check, or money order, and We Pay Postage. **Visors fit all cars—any style windshield.**

YOUNG PRODUCTS Dept. 24 **2605 Elmhurst, Detroit 6, Mich.**

Copyrighted material

It's Easy and Great Fun to Build This Collector's Scale Model . . .
1906 COLUMBIA ELECTRIC!

WHEN grandma was the dauntless motorist of her day, this shiny, spotless car was "the vehicle of fashion." In 1906, Columbia Electrics advertised no cranks to turn, no rattles and no explosions!

1906 Columbia Electric Measures 6½" in length when complete — $2.50

IN A few leisure hours you, too, can build this collector's item! It's easy with "Old Timers" because they are authentic ¾" scale models completely pre-fabricated with ready-shaped parts, cast wheels, lights, horns, radiators, etc. Easy to follow step-by-step instructions included. Perfect as den and desk ornaments; can be converted into lamps, etc. Nationally known; satisfaction guaranteed. At hobby, toy and department stores.

1914 Stutz Bearcat — $3.95

1911 Maxwell — $2.50

1910 Model "T" Ford	$2.50
1909 Stanley Steamer	$2.95
1904 Olds	$1.95
1911 Buick	$2.50
1903 "A" Ford	$2.50
1909 "T" Ford	$2.95
1903 Cadillac	$2.50
1900 Packard	$2.50
1903 Rambler	$2.50
1902 Franklin	$2.50
1910 Inter. Harvester	$2.95
1913 Mercer Raceabout	$3.95
1906 "Old 16" Loco.	$3.95

Write to us. Add 25c for postage and handling. No C.O.D.'s, please.

hudson miniatures OLD TIMERS
"Originators of Antique Autos in Miniature"
SCRANTON HOBBY CENTER, Dept. 28, Scranton 10, Pa.

EXTRA CASH for YOU!

TAKING ORDERS
Full Time—Spare Time for
STARK FRUIT TREES

Send No Money—You don't need experience to Make Money this EASY WAY! Show friends, neighbors, others how to make small back yards, vacant lots, and tiny plots produce *bushels* of luscious, taste-tempting fruit—Apples, Pears, Plums, Peaches, Cherries, Berries, etc.—and cut food costs to the bone. Take orders for hardy, new, Quick-Bearing Stark Fruit Trees. Sensational U.S. Patent Leaders bring easy orders, pay you rich rewards in extra cash profits. Added income with beautiful Stark Ornamentals, Roses, Shrubs to home owners. Enormous demand for attractive landscaping. Stark Bro's is largest and oldest nursery in the world. Join the leader.

SENSATIONAL DWARF FRUIT TREES
Ideal for backyard and vacant lot orchards. Yield fruit years earlier! One bushel or more of *full size fruit* from each tree. Plant up to 9 trees in only 20 ft. sq. plot. Sell everywhere—make money!

FREE SALES OUTFIT AND BEAUTIFUL PLATE BOOK—Everything you need to make money—given you FREE. Just send name, address on Coupon below. No experience is needed. Giant demonstration Sales Outfit includes beautiful color Photo Plate Book. Write

STARK BRO'S
Dept. 2902, Louisiana, Missouri

STARK BRO'S Dept. 2902, LOUISIANA, MISSOURI
Rush FREE Demonstration Sales Outfit. Include your new 1952 Stark Colorphoto Catalog —showing Stark Fruit, Berries, Ornamentals.

PSM 10-51

NAME _____

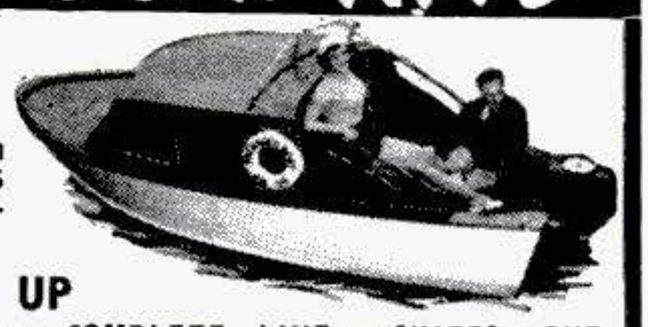
ADDRESS _____ COUNTY _____

TOWN _____ STATE _____

PACKAGED BOAT KITS

LARGEST CATALOG EVER OFFERED!

16 pages—80 construction and action photos PLUS specifications and performance data.



$38.95 UP

COMPLETE LINE — SKIFFS, OUTBOARDS, RACERS, CRUISERS.
23 Models! Kits, Semi-finished and Custom-finished boats, hardware, paint.

SEND 35c FOR BOAT CATALOG
BOAT CATALOG PLUS booklet on boat building, $1.00

BOAT PATTERNS-BLUE PRINTS

Over 70 modern plans and full size patterns. Racing classes, cruisers, inboards, outboards, sail boats. By famous designers. 6' to 30'. DESIGN CATALOG 35c. DESIGN CATALOG and boat building handbook, $1.00.

MARINE MART-DEPT. 51-BUFFALO 7, N. Y.

THROWING DAGGER $2 postpaid

This MALAYAN FIGHTING KNIFE is used for self-defense, killing game, target skill. A powerful, silent, accurate weapon. Splits 1" board at 30 ft.

BALANCED TO STICK!

Fun, Thrills, Excitement!

Indoors - outdoors. Learn this Sport! Easy to throw accurately with our clear instructions. Beautiful, heavy-duty 10" knife. Tempered steel. Tough, rawhide-bound handle. Rare souvenir, unusual bargain. Limited quantity. Sold direct only. Send $2

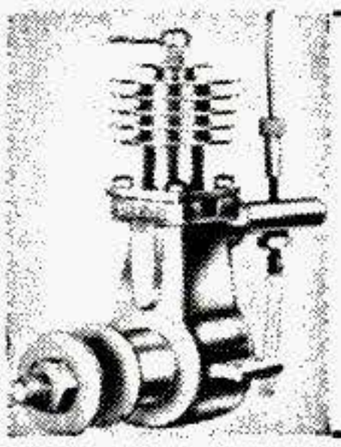
WHOLESALE IMPORT CO., Dept. 7, 604 S. Marengo, Alhambra, Calif.

9 mm German Auto
LUGER $39.50

Official German Army. Condition "Very Good." Fixed sights, special safety. Muzzle velocity 1150 ft. per second! Striking energy 365 foot lbs. **"Excellent condition"—$49.50.** 8-cartridge magazine. Ammunition (American or German) available everywhere. Overall length 8¾". Weighs 31 oz. No C.O.D.'s. F.O.B.

Unconditionally Guaranteed

If not satisfied return within 5 days for full refund. Immediate delivery. In ordering you must state in your order you are not a minor, alien, fugitive from justice or been convicted of a crime of violence. **UNITED ARMS CO., 9043 S. Western Ave., Dept. FA-655, Chicago 20.**



Our 430th Advertisement

REAL DIESEL ENGINE

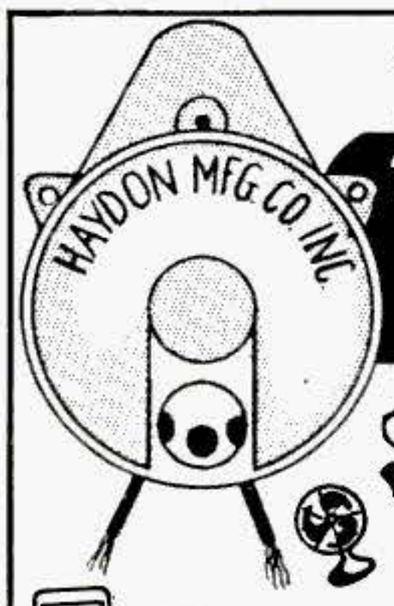
$2.95

- for planes, boats, midget cars
- 7500 RPM; 1/7 HP; ht. 3½"; wt. 5 oz.
- precision machined for smooth operation

You just can't beat this price for a precision diesel engine! Streamlined, compact, easy to install. Thousands of satisfied users all over the world. Fast delivery if you ORDER TODAY! Send $2.95 plus 25c postage.

Gotham Hobby Corp. Dept. S, 107 E. 126th St. New York 35, N.Y.

Make Your Appliances *Completely Automatic* with this



Haydon TIMING MOTOR

ATTENTION HOBBYISTS! Use this motor to make your own timing attachments for your electric appliances . . . fan timer, automatic defroster, radio program timer, photo timer, etc. Thousands of uses for this brand new Haydon Timing Motor. 1-rev. per hour, L. H. rotation, 110 volt, 60-cycle, 3 watts. MONEY BACK GUARANTEE! Order today! $3 postpaid.

Mar-Cone Co., 911 Franklin, Dept. PS-1510, St. Louis 1, Mo.

GIVE THESE FOR CHRISTMAS

AIR PISTOL

Straight-shooting, hard-hitting target pistol that looks and hefts like an army .45. Wonderful for the woods or rumpus room. Makes any basement or yard a target range. Caliber .177, shoots BB's, darts, and pellets. Muzzle loads, cocks like real weapon. Complete with assortment of ammunition. Guaranteed. Sharpen your eye and amaze your friends. Payment in full must accompany pistol orders. Each..... **$5.95**

EXTRA AMMO AVAILABLE:

Darts, Doz. **50c;** BB's, 150 **15c;** Pellets, 500 **$1.50**

GIANT BALLOONS

Neoprene: Surplus Govt. Weather and Target Balloons. Terrific attention getters for Lodges, Civic Events, School Functions, Conventions, Exhibitions, Trade Shows. Advertise your special events in the Hollywood manner. Make any occasion a success. Great back-yard fun. Marvelous for parties, dances, fairs, picnics, all festivities.

3 Ft. Dia. 39c **6 Ft. Dia. 79c** **13 Ft. Dia. $1.39**

Straight-away Pictured (See Price Below)

SPRINGFIELD RIFLE STOCKS

With modified Pistol Grip. Genuine Army Surplus rifle stocks. New, untreated, straight-grained, solid walnut, free of cosmolene. All perfect. No warpage. A $40 value. You'll never find a better bargain. **$3.95**

Limited Supply Other Rifle Stocks, Same Quality & Perfection, Army Surplus

Army Carbine.....$1.95 Springfield Straight-away....$1.25
Paratroop Carbine.....$5.95 Also: Enfield Hardwood Stocks.$3.95

We Pay postage on prepaid orders. Calif. Res. add sales tax.

WAR ASSETS DIV.

VOLUME SALES CO.

Dept. S-1051, 3930 Sunset Blvd., Los Angeles 29, Calif.

HOME PLANS THAT SAVE YOU MONEY

New popular Home Plan Books showing actual photos or color pictures (and floor plans) of over 233 popular sizes and styles of homes. Working drawings, material lists, specifications available for each plan—AT LOW COST. Order your books today.

Choice Selected Homes....50c Over 75 designs, 32 in color.
Ranch and Suburban.....50c 158 designs, town and country.

Both Books Postpaid $1.00 2 to 4 bedroom sizes.

America's Pioneer Residential Plan Service

L. F. GARLINGHOUSE CO., INC., Box PS-11 TOPEKA, KANSAS

LAWN ORNAMENT-NOVELTY PATTERNS

28 Lawn Ornament Patterns, 25c. Other patterns: 15-20" high; Dutch Girl, Dutch Boy, Pirate, Bull Terrier, Mexican Girl, Mexican Boy, Dwarf, Penguin, Flower Girl, 10c each. 25 Novelty Patterns, 30c. All 62 Full Size Patterns, $1.00 Postpaid.

FLYING DUCK

Wind revolves wings. Realistic appearance. Pattern, Instructions and wing Pinion Kit; brass bearing, steel shaft, wing lugs, bolts, nuts and washers, 50c. Pattern and Instructions without kit, 25c. Postpaid.

STROTHER PATTERN SERVICE

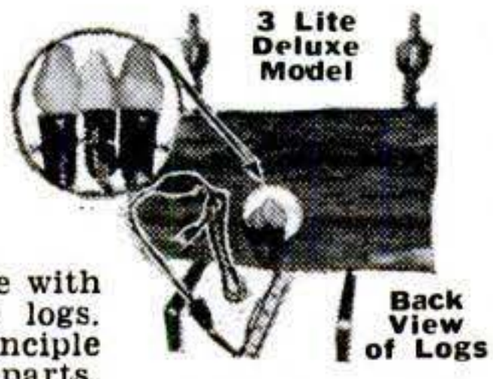
Dept. 7-CF Box 128 Belington, W. Va.

ELECTRIFY YOUR OWN FIREPLACE WITH THE

Fireplace Flicker Flame

EXTENSION CORD

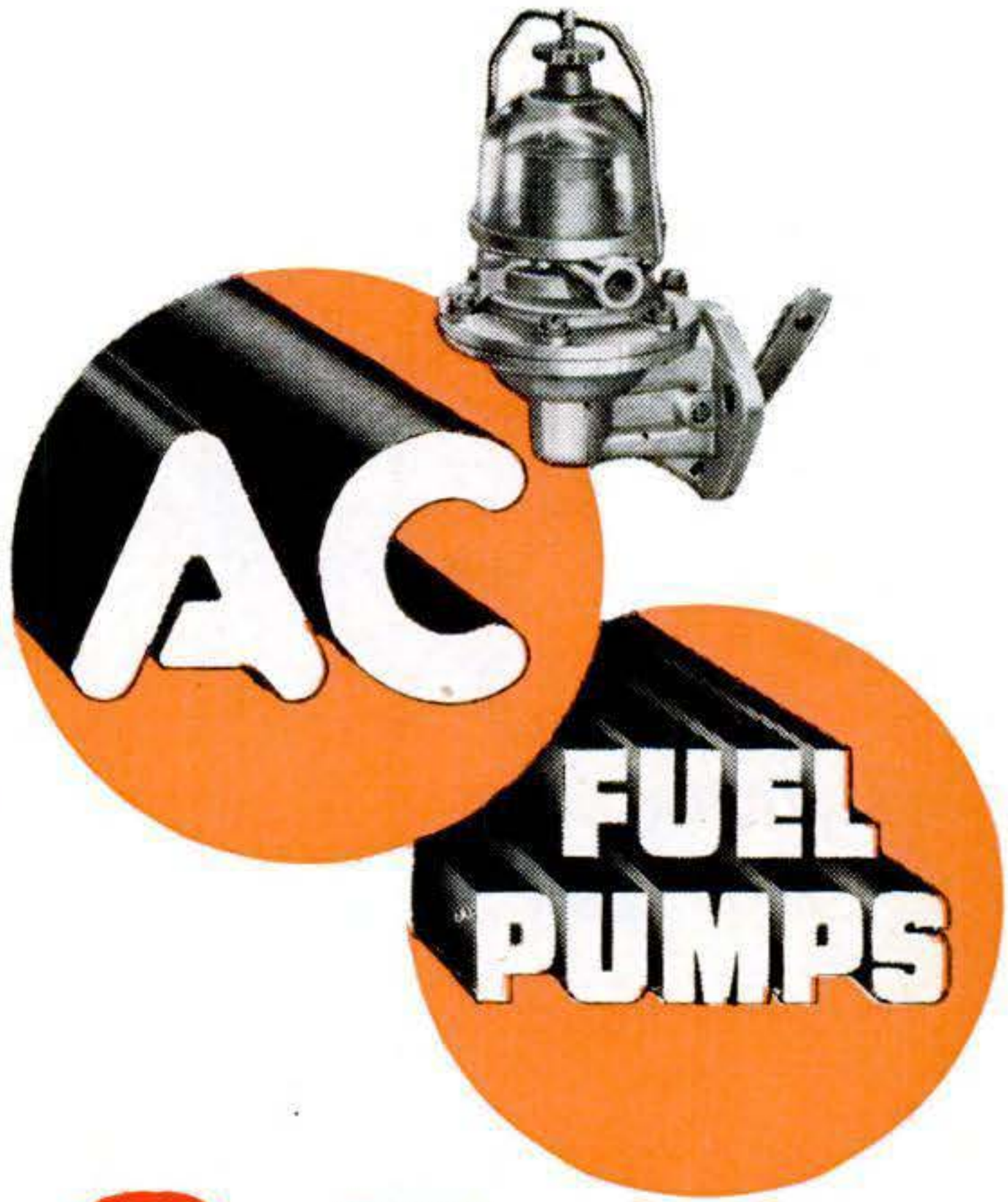
SEND FOR FREE DESCRIPTIVE FOLDER



Designed to light up your fireplace with a glowing likeness of burning logs. Works on a new patented principle without any mechanical or moving parts. Each FIREPLACE FLICKER FLAME is equipped with 9-ft. extension cord and off-on switch. Operates on 110V AC-DC, drawing less than 20 Watts without interference to radio or television reception. Can be installed by YOU in any imitation or real fireplace. Can produce FOUR different lighting effects.

Money Back Guarantee in 10 Days
3-Lite Deluxe Model—$2.50 Postpaid
Send Check or Money Order Now to

P. O. Box 468 CON CORD COMPANY Caldwell, N. J.



THE Original Fuel Pumps

There Are NONE Better

- ★ More than 40,000,000 in use.
- ★ More than 100,000,000 built.
- ★ Backed by 24 years of "know-how."

America's First and Finest

FUEL PUMPS

AC SPARK PLUG DIVISION
GENERAL MOTORS CORPORATION

Copyrighted material

GUN CLUBS

There are thousands of active clubs in U.S.A. with excellent facilities for enjoyable shooting. The nicest folks in town are members. Ask about your local club.

NEW!

MOSSBERG 4-POWER SCOPE MODEL 2M4

For high or low mounting. Fits nearly all makes of rifles up to 25-20 cal.

•

New, improved, sturdier CAST mount screws to receiver.

•

All lens surfaces hard coated, assuring clear, sharp image.

•

All Mossberg rifles have receivers either *tapped* and *drilled* for #2M4 or grooved for #4M4.

Ask for MOSSBERG SCOPES at your dealer's

O.F. Mossberg ® & SONS, INC.

FREE Catalog Send for it.

No sales at factory

16510 St. John St., New Haven 5, Conn.

GROW MINIATURE TREES FOR PROFIT & PLEASURE

Fabulous Money–Real Fun! Grow *genuine live* dwarf (Ming) trees. A terrific new business and hobby. Astounding details Free. Write —

DWARF TREES, Dept. 12
P. O. Box 355 • Briggs Station
Los Angeles 48, California

FOR SPORTS — FOR FUN

World's Finest "EM-GE"

BLANK PISTOL

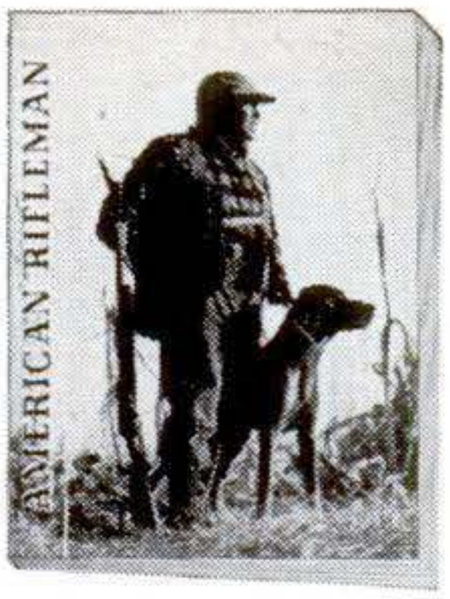
"Shoot the Works"—safely—with this handsome blank pistol. Looks and sounds real enough for the FBI. But it can't hold regular cartridges. Six-shot magazine; safety catch. Precision-built of carbon steel. 3¼" long. A world-famous pistol, excellent value at.... **$10.95**

De luxe model with pearl handle $15.00

100 blank cartridges $1.50

ORDER BY MAIL
No Permit Required.
Send Check or Money Order.
Dealer Inquiries Invited

J. L. GALEF & SON, Dep't. L-4, 85 Chambers St., N.Y.C.



ARE YOUR GUNS WORTH $4.00?

That's all it costs for a whole year of the AMERICAN RIFLEMAN, big monthly magazine exclusively about guns. You'll get a real thrill from this grand old friend, long the favorite of shooter-sportsmen. Too, you'll get prompt notice whenever your right to own and use your guns in sports is threatened by "anti-gun" legislation. And you can apply for membership in the National Rifle Association, with many extra benefits at no additional cost! Send only $4.00 for an annual subscription now . . . and get a FREE copy of the NRA Manual HOW TO SHOOT A RIFLE ($1 extra value), plus a confirming application for annual NRA membership.

NATIONAL RIFLE ASSOCIATION
1607-B Rhode Island Ave., N.W., Wash. 6, D. C.

FANS! FANS!

ALL TYPES — ALL SIZES

Kitchen Ventilators, Exhaust Fans, Attic Fans, Blowers, Heat Boosters, $7.95 up, Desk Fans, Window Fans, Blades, Guards, Shutters, Motors, etc.
Free illustrated catalogue, dealers inquiries invited

EDWARDS BROS. *ESTAB. 20 YEARS*
WESTERN APPLIANCE CO., INC.
5650 Grand River Ave., Dept. F, Detroit 8, Mich.

AXLE ASSEMBLIES

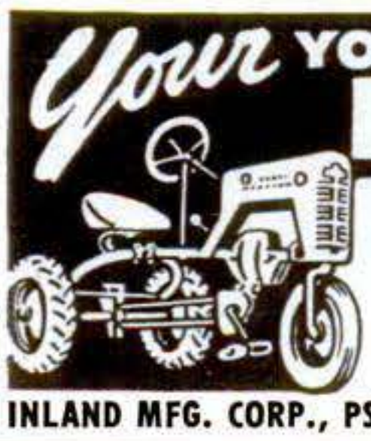
Ideal axles for farm implements, carts and trailers of all kinds

$58.01 Less Tires F.O.B. Factory

Solid steel construction with springs and saddles—U-bolts and shackles—spring bolts and brackets—hubs and bearings and 15" or 16" Wheels—shipped complete, ready for use. Dept. 14J

HAMMER BLOW TOOL COMPANY — Wausau Wisconsin

Your YOUNGSTER WILL LOVE IT!



Give your youngster a TRACTALL for the joy-ride of a lifetime! Looks just like a man-size Tractor. The perfect gift for boys, girls, up to 12 years old. **Chain Drive.** Sold *only* direct from factory. **Write for Literature, FREE trial offer.**

INLAND MFG. CORP., PS-10 • 164 Ellicott St., Buffalo 3, N. Y.

BUILD and **DRIVE** your own **high speed racing boat** as hundreds of others are doing! Easy to•follow our **simplified plans** for newest types of racing craft. Large selection of full race **Hydroplanes** ranging from 6 ft. to 20 ft. lengths. **Service, Racing, Utilities,** and **3 Points.** Both inboard and outboards.

SEND 25c for CATALOGUE containing pictures and descriptions of **Champion Boats** for which plans are designed and distributed exclusively by **CHAMPION BOATS, P. O. Box 9038, Dept. 18-J, Long Beach, California, U. S. A.**

Copyrighted material

KIEKHAEFER

own a MERCURY "Super 10" Hurricane

There's brilliance on the water in the flashing performance of a "Super 10" Hurricane. With countless speed and endurance records in its wake, this power-packed beauty of a Mercury gives you the unequalled benefits of Full Jeweled Power*...plus all the other pace-setting features which have made MERCURY the *favorite name* of outboard enthusiasts everywhere. SEE YOUR MERCURY DEALER FOR A DEMONSTRATION!

A few of the MANY FEATURES:

- Exclusive, "Hi-Rev" micro-mounted connecting rods of drop forged chrome nickel-moly steel.
- Improved porting. Larger crankcase opening.
- High R.P.M. Waterproof Magneto for safe, all weather operation.
- Eight Reed Valve Cage with Vari-timed Valves.
- Exclusive, Drop Forged, Unbreakable Aluminum Clamp and Swivel Brackets.

*Ball and Roller Bearings Throughout

Features of Mercury motors are protected by issued or pending patents.

Write for free Booklet— "PICK OF THE PILOTS"

KIEKHAEFER CORPORATION • Fond du Lac, Wisconsin

AMERICAN POWER BOAT ASSOCIATION

Copyrighted material

More Hours of FUN
with this NEW Outdoor Light

Model 200

NEW Coleman®
FLOODLIGHT LANTERN

You can fish and hunt longer, have plenty of light on the trail or in camp at night with this great new all-purpose Coleman Floodlight Lantern. Superior in structure, appearance and service; more compact in design; sturdier built for hard use. Improved burner. Larger fuel fount (1⅓ pints) gives 8 to 10 hours lighting service. New attractive red porcelain ventilator top. Instant lighting. Floodlights 100 ft. area. Stormproof. Safe. See it lighted—ask your dealer.

Big Outdoor Spotlight

Easily attached Coleman Reflector makes a powerful spotlight of your lantern. Concentrates a flood of brilliant light wherever wanted. Made of high luster steel; adjustable handle.

Easy Meals Quick . . . More Fun

Coleman® FOLDING CAMP STOVE

Cooks like a city gas range. Lights instantly; easily regulated. Folds up and carries like a suitcase. Durably built for long service. See your dealer.

The Coleman Company, Inc., Wichita 1, Kansas

MAIL COUPON TO The Coleman Co., Inc., Dept. 102-PS2 Wichita 1, Kans.

Please send me free literature about Coleman Lanterns, Camp Stoves and other Coleman Appliances.

NAME_____

ADDRESS_____

CITY_____ STATE_____

DECORATE YOUR DEN

ORDER TODAY!

ROLLING BLOCK RIFLE

Sword type Bayonet **$2.50**

Guns in shooting order $5 extra

WESTERN ARMS CORPORATION

Dept. F 415 E. Pico Blvd., Los Angeles 15, Cal.

NEW! CHEAP! OIL BURNER
SWEEPING THE COUNTRY!

$14.75 for Stoves
$29.50 for Furnaces

BIG CASH DISCOUNT FOR INTRODUCING. SLIPS INTO ANY COAL STOVE, RANGE OR FURNACE. Amazing, quick intense heat—by finger-tip control. No more shoveling coal or ashes. We'll let you try it in your own home for one month. BIG BONUS FOR TESTING. Prove it pays for itself by what it saves. Write today for wholesale prices.

NORTHWEST MFG. CO., 361-M Main, Mitchell, S. Dak.

HIGH POWER TELESCOPES

40 Power—opens to 36 inches. Precision & Polished Lenses. Ideal for Studying Stars, Plane Spotting or Interesting Pleasures. Satisfaction Guaranteed or Money Refunded. Send Check or Money Order to

$3.49 paid Post-

CRITERION CO., Dept. PS10, 438 Asylum St., Hartford 3, Conn.

$750 BUILDS 4 ROOMS & BATH!
WHY PAY RENT?

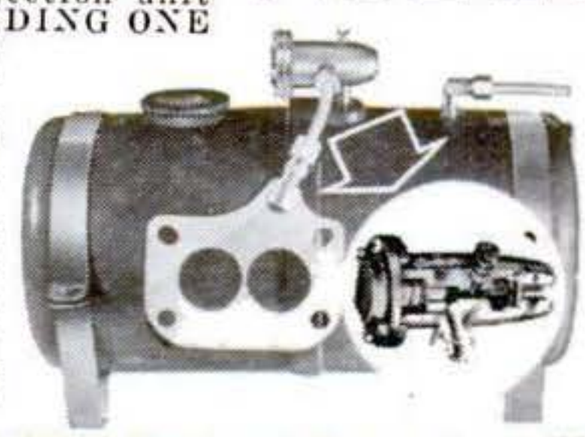
For Seven Hundred Fifty Dollars and 30 days of your spare time, you can build yourself this Beautiful Home. Living room 11x15, Front bedroom 9x11, Back bedroom 10x12, Kitchen 9x11, Bath 5x8, Hall 3x4, Wind out steel Casement windows, Concrete block, stuccoed. $1.00 brings you Step-by-Step Instructions, Blueprint & Material List.

L. H. FARROW, Dept. D
Box 645 Columbus 16, Ohio

BURN WATER in your CAR
with the AMAZING OCTA-GANE "50"

FREE!

Learn how you can enjoy all the benefits of water-alcohol injection with this all bronze, "fog type", exhaust pressure operated injection unit WITHOUT SPENDING ONE CENT. . . . NOW OR EVER. Our sensational new "cost-free" plan, which requires no selling, helps you get automotive accessories, economy products and "hot rod" equipment absolutely Free. Write today for full details and catalog of products offered.



NARCO, Dept. OG-10, 350 W. Washington Blvd., Venice, Calif.

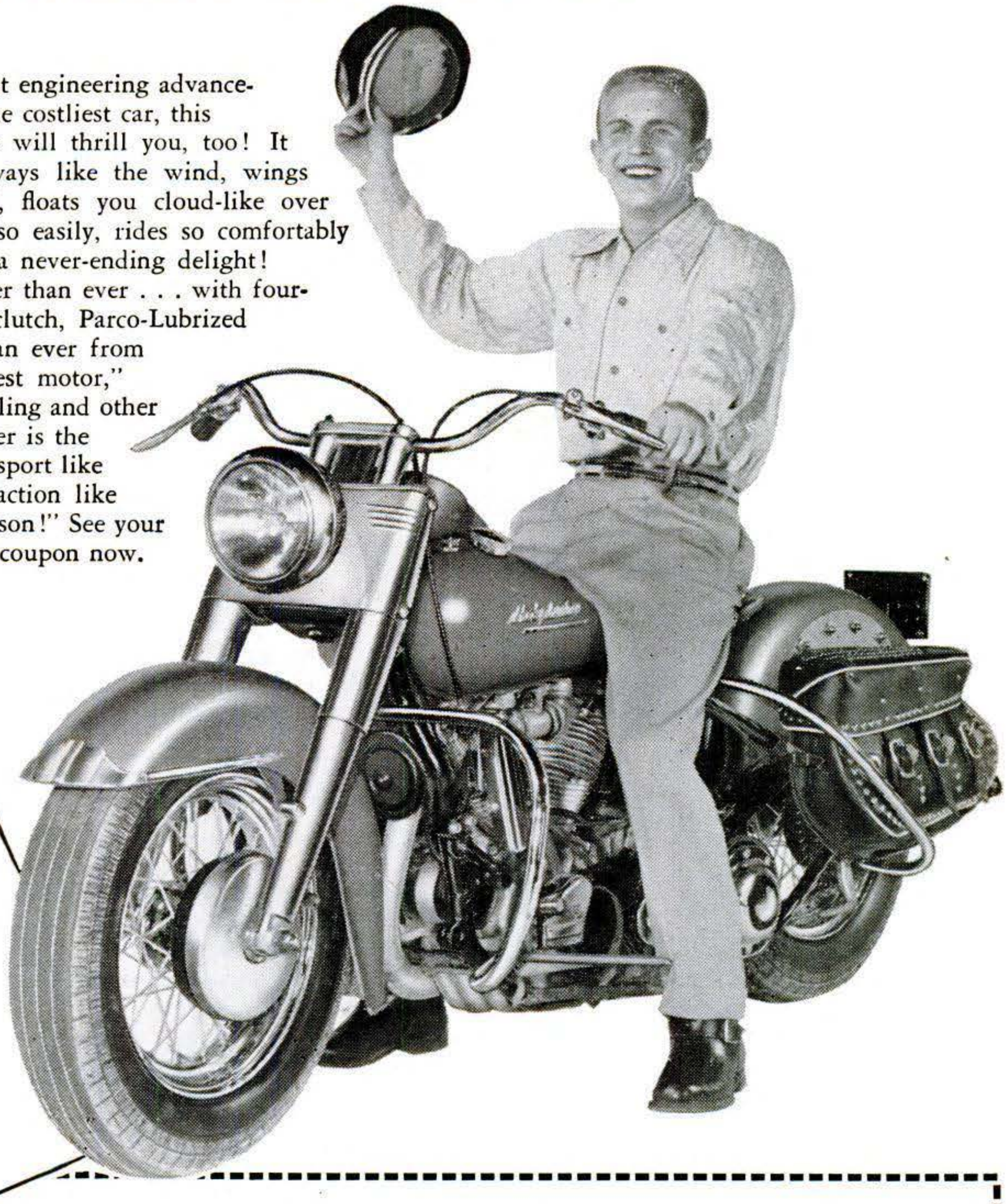
Copyrighted material

Proudest man in motorcycling!

He owns the world's greatest motorcycle

1952 HARLEY-DAVIDSON HYDRA-GLIDE®

Star-studded with newest engineering advancements, and built like the costliest car, this greatest of motorcycles will thrill you, too! It whisks over straightaways like the wind, wings over hills like a bird, floats you cloud-like over roughest roads, steers so easily, rides so comfortably even longest trips are a never-ending delight! And this year, it's better than ever . . . with four-speed foot shift-hand clutch, Parco-Lubrized valves, more power than ever from "motorcycling's mightiest motor," luxurious new color-styling and other features. Truer than ever is the old saying, "There's no sport like motorcycling, no satisfaction like owning a Harley-Davidson!" See your dealer today. Mail the coupon now.



featuring...

- New 4-speed foot shift-hand clutch
- New low-toned, power-boosting muffler
- New Parco-Lubrized exhaust valves
- New longer-life tire tread
- New colorful styling

HARLEY-DAVIDSON MOTOR CO., Dept. PS, Milwaukee 1, Wisconsin

Send me free copy of ENTHUSIAST Magazine filled with motorcycle action pictures and stories; also literature on new models.

Name.....

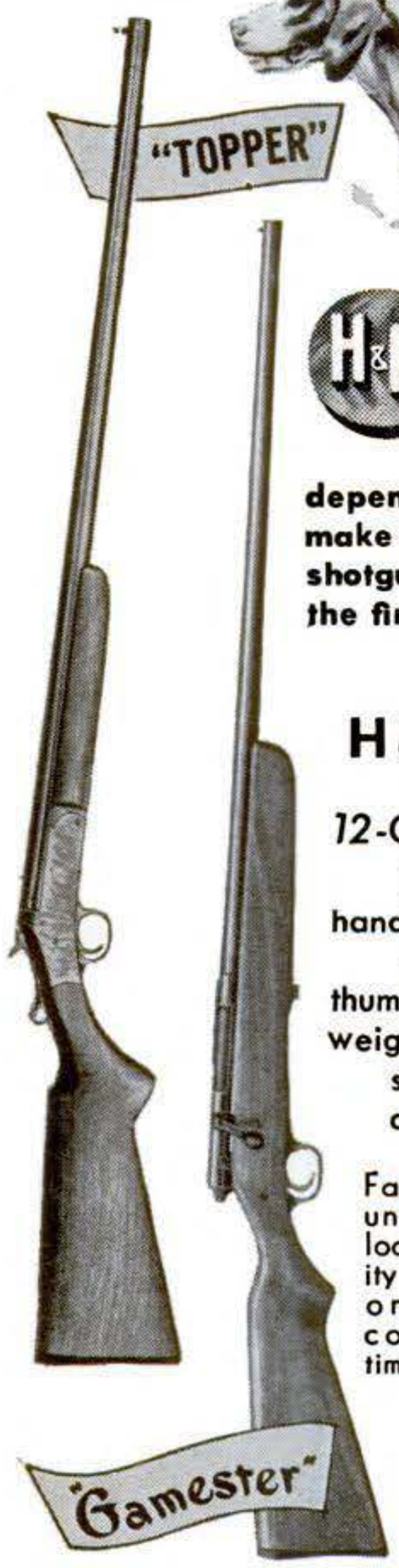
Address.....

City.....State.....

DEALERS WANTED: A few franchises available for the full line of famous Big Twins and the 125 Model. Write today.

Copyrighted material

it's a Great Day for Gunning



when you carry an H&R SHOTGUN

A dependable dog . . . and a dependable gun — what a set-up! To make the picture perfect, tuck an H&R shotgun under your arm and enjoy the finest shooting.

H&R "Gamester"
MODEL 348

12-Ga. 3-shot Bolt Action Repeater

Light, so perfectly balanced . . . handles like a dream!

48½" over-all; 2¾" shells; side thumb safety; automatic ejection, weighs 7¼ lbs., metal bead front sight, hand-rubbed oil-finish American walnut stock.

Faster, easier under-forestock loading. A quality feature found only on guns costing many times more!

H&R "TOPPER"
MODEL 48

Single Barrel Shotgun

The world's largest selling single barrel shotgun! Smooth action, trim lines plus a reputation for never shooting loose.

Available in 12, 16, 20 and .410 gauges. Hammer with coil spring action. Weighs 5 to 6½ pounds. Hand-rubbed oil-finish American walnut stock.

See these H&R shotguns at your gun dealer's.

FREE CATALOG on all H&R fine sporting arms. Write today.

HARRINGTON & RICHARDSON ARMS CO.

108 Park Avenue, Worcester 2, Mass.

Executive Sales Offices
Investment Building
Washington, D. C.

Canadian Subsidiary
H&R ARMS CO., Ltd.
Drummondville, Quebec

QUALITY ARMS FAMOUS THE WORLD OVER

BOAT KITS
For Home Assembly

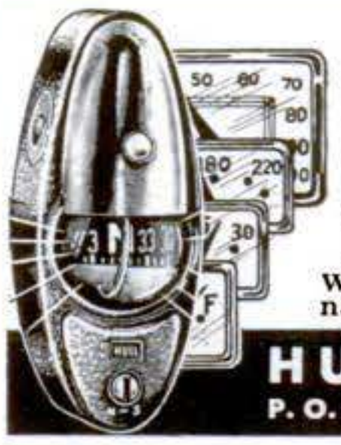
PRAMS
$39.60 up
8 TO 11 FT.
ALSO WITH SAILS

26 MODELS
KAYAKS
DINGHIES
ROWBOATS
RUNABOUTS
OUTBOARDS
INBOARDS
CABIN CRUISERS

NEW CATALOG
MOST COMPLETE EVER OFFERED
1 - BOAT KITS 26 MODELS
2 - MARINE HARDWARE
3 - MARINE ENGINES
4 - MARINE CONVERSIONS
5 - PAINTS & COLOR CHARTS

All Only 35c, SEND COIN TODAY

U-MAK-IT PRODUCTS 703R-WHITTIER ST. New York 59, N. Y.



The FIFTH Essential Instrument

HULL AUTOMOBILE COMPASS

● Like your other important instruments, a Hull Automobile Compass gives you . . . quickly, easily, accurately . . . a vital fact about your car—the DIRECTION it is going. Know your way, anywhere, with a Hull. Proved dependable for 18 years.

Write for local dealer's name and free literature.

HULL MFG. CO.
P. O. Box 246-E10, WARREN, O.

Beaconlite® $6.95
illuminated
STREAMLINE® $4.95
standard (not illus.)

Mustang

LIGHTWEIGHT
$362.20
(Fed. tax paid, at factory)

9.5 hp. 4-cycle. 3-speed. Foot-shift. Over 70 miles per gal. Over 60 m.p.h. Write for free circular.

MUSTANG, Dept. PS
635 W. Colorado, Glendale 4, Calif.

SEND FOR NEW GIANT BOOK ON ELECTRIC TRAINS

—48 big pages. Over 100 color pictures. Shows and describes new American Flyer Trains with sensational Air Chime Whistle—the world's only scale model trains with 2-rail track, smoke and "choo-choo" sounds. Talking Railroad Station and other spectacular equipment. Send 10c to Gilbert Hall of Science, 248 Erector Square, New Haven, Conn.

Hi-Standard

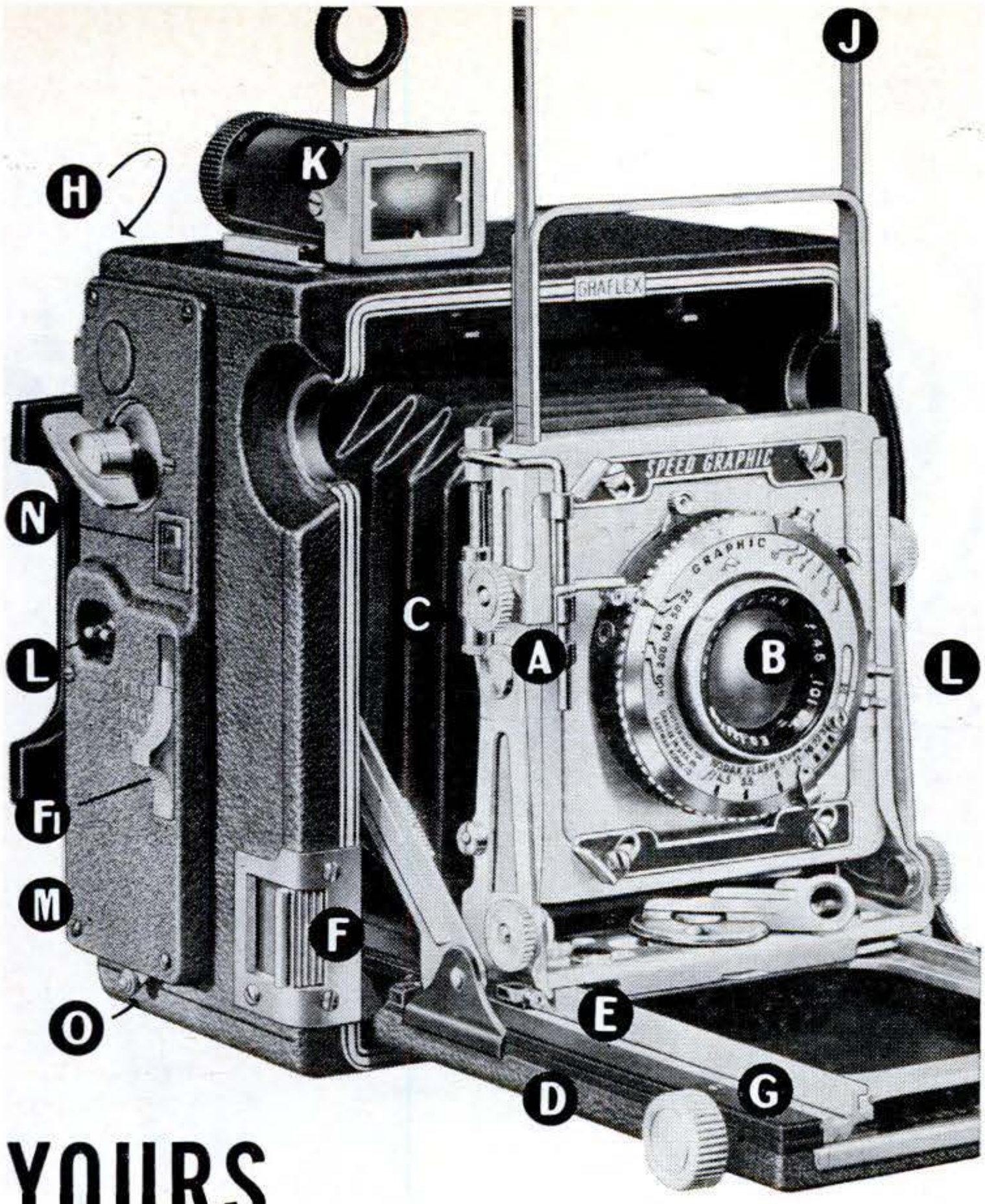
. . . . complete line of .22 cal. automatics
Which do you prefer?

SPORT-KING.....for plinker-fisherman-camper
FIELD-KING.....low priced target model
SUPERMATIC.....finest target pistol made
OLYMPIC.....22 Shorts-for indoor-outdoor use

FREE, illustrated folder describing all guns.

THE HIGH STANDARD MANUFACTURING CORP.
Dept. 17J Dixwell Avenue, Hamden, Connecticut

Copyrighted material



YOURS . . . FOR BETTER PICTURES!

You must handle a Graphic to realize all its advantages. Though packed with every feature a professional could need, the Graphic can be used with all the ease and speed of an ordinary folding camera. That's one reason why America's press cameramen use them . . . and why you'll make better pictures with your Graphic too!

THE SPEED GRAPHIC. As illustrated. 2¼ x 3¼, 3¼ x 4¼; or 4 x 5.

THE CROWN GRAPHIC. Identical to the Speed Graphic except for focal plane shutter. Lower in price.

THE CENTURY GRAPHIC. Lowest-priced, yet with many Graphic features . . . including ground glass focus; built-in flash sync.; Graflok back; coated f/4.5 lens. 2¼ x 3¼ . . . only $109.50. Prices subject to change.

ACCESSORIES TO KEEP PACE WITH YOUR SKILL!

Graflarger

Grafmatic

120 Roll Holder

Graflite Flash

A. CONTORTIONIST FRONT. For corrected perspective whenever you want it. Simple controls raise or lower the lens, shift it sideways, or tilt.

B. INTERCHANGEABLE LENSES. A flip of the slide locks and your lens is ready to be replaced with a portrait, wide-angle, telephoto or other accessory lenses.

C. DOUBLE EXTENSION BELLOWS. For extreme close-ups. Permits full-size copy with standard lens. Invaluable too, when using special lenses.

D. DROP BED. Helps correct perspective in conjunction with tilting lens board . . . and for use with wide-angle lenses. Bed remains linked to focusing knobs.

E. FOLDING INFINITY STOPS. Bring the front into exact calibration with Vernier focusing scale and squared with film plane. Stops fold back, allowing front to move farther forward. Additional sets of stops can be installed for use with different lenses.

F. BODY SHUTTER RELEASE. Set right in the camera body for extra stability at the instant of exposure. **(F.I.)** Speed Graphic has selector control too, for instant choice of shutters operable by the same release.

MULTIPLE FOCUSING CHOICE. Use one, or use them together, they guarantee razor-sharp focus! **G.** The accurate Vernier type focusing scale on camera bed . . . **H.** Ground glass focus through the lens . . . and the coupled Kalart rangefinder (optional). MULTIPLE VIEWING CHOICE. **J.** Folding open frame viewfinder with parallax correction . . . **K.** Tubular optical viewfinder with parallax correction (optional on Century Graphic) and the ground glass screen.

L. BUILT-IN FLASH SYNCHRONIZATION.

M. GRAFLOK BACK. Designed to take such valuable accessories as 120 Roll Holder, Graflarger and Grafmatic Film Holder.

N. DIRECT READING FOCAL PLANE SHUTTER SPEEDS. No tables to consult. No calculations.

O. GOVERNOR SELECTOR. Doubles or halves exposure with flick of finger. Insures optimum accuracy of shutter.

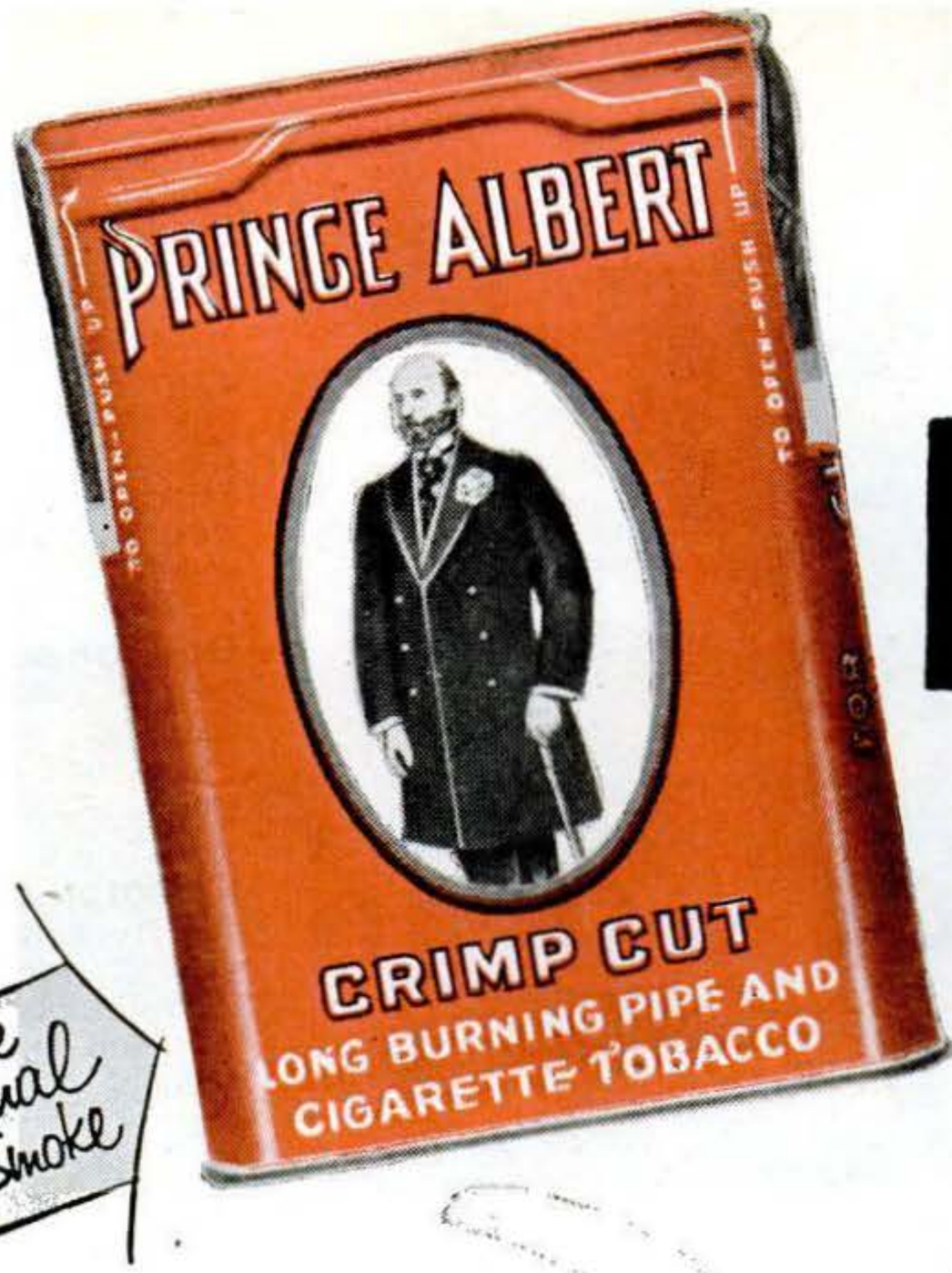
GRAFLEX
Prize-Winning Cameras

Graflex, Inc., Dept. 107
Rochester 8, N. Y.
Please send details on:-
☐ Speed Graphic ☐ Crown Graphic
☐ Century Graphic ☐ Roll Holder
☐ Grafmatic ☐ Graflarger
☐ Graflite Flash

Name.....
Street.....
City.....*Zone*.....*State*.....

Copyrighted material

Bite's Out



Pleasure's In!

the National Joy Smoke

PRINCE ALBERT'S PATENTED* "NO-BITE" PROCESS MEANS REAL PIPE COMFORT

R. J. Reynolds Tobacco Co., Winston-Salem, N. C.

Whether you smoke a pipe or roll your own . . .

get crimp cut Prince Albert, choice tobacco specially treated to insure against tongue bite. Rich tasting — and so mild, P. A.'s the big favorite with roll-your-owners, as well as pipe smokers.

*Process Patented July 30, 1907

More Men Smoke

Prince Albert

than any other tobacco

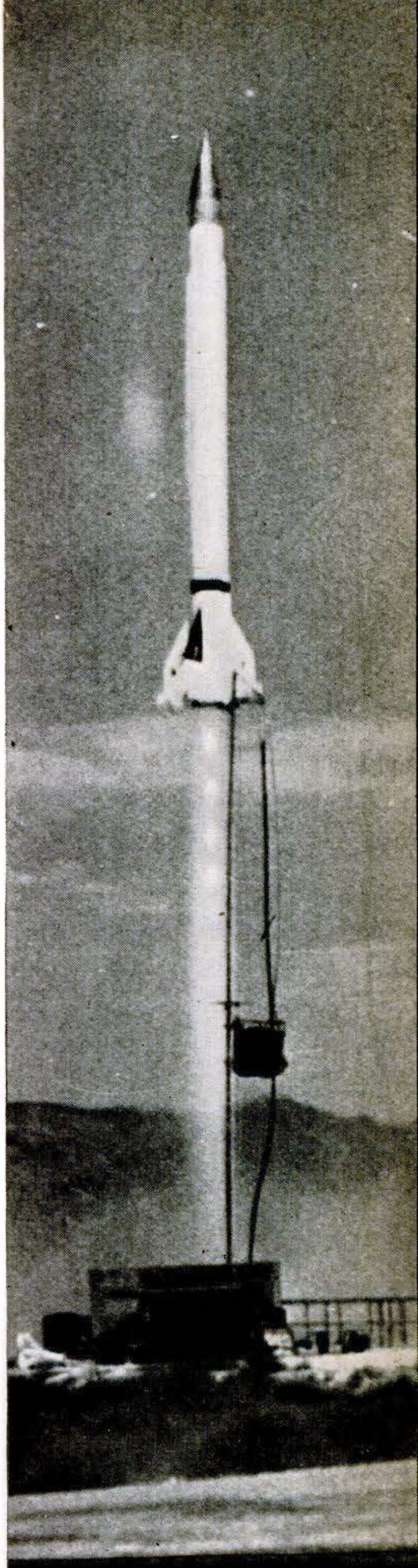
Copyrighted material

Popular Science *Highlights* This Month

When the bird is on the wing, hunters worry about their aim, not the performance of their shotgun shells. They're sure-fire—thanks to a mass-production miracle that combines 212 manufacturing operations to turn out 1,800,000 shells a day from one plant. Page 170

Used power tools can be good buys for your home workshop—IF you know what to look for and to look out for. Here's how to tell the bargains from the busts. Page 201

The Russian limousine above, a Zis-110, was captured in Korea and sent home to Gen. Walton Walker's widow. It will be on display at the Motorama in Los Angeles next month. You'll find a lot more about Russian cars—the Moskvich, the Pobeda and the rest of the Red auto line—in this issue. Page 106



"Lucky Seven," the Navy Viking, above, recently broke all altitude records for single-stage rockets by soaring 135 miles. The next step toward interplanetary flight may be a man-carrying satellite assembled 1,100 miles out in space to circle the earth. Page 120

Copyrighted material

A Scientist Previews

The First Atomic Airplane

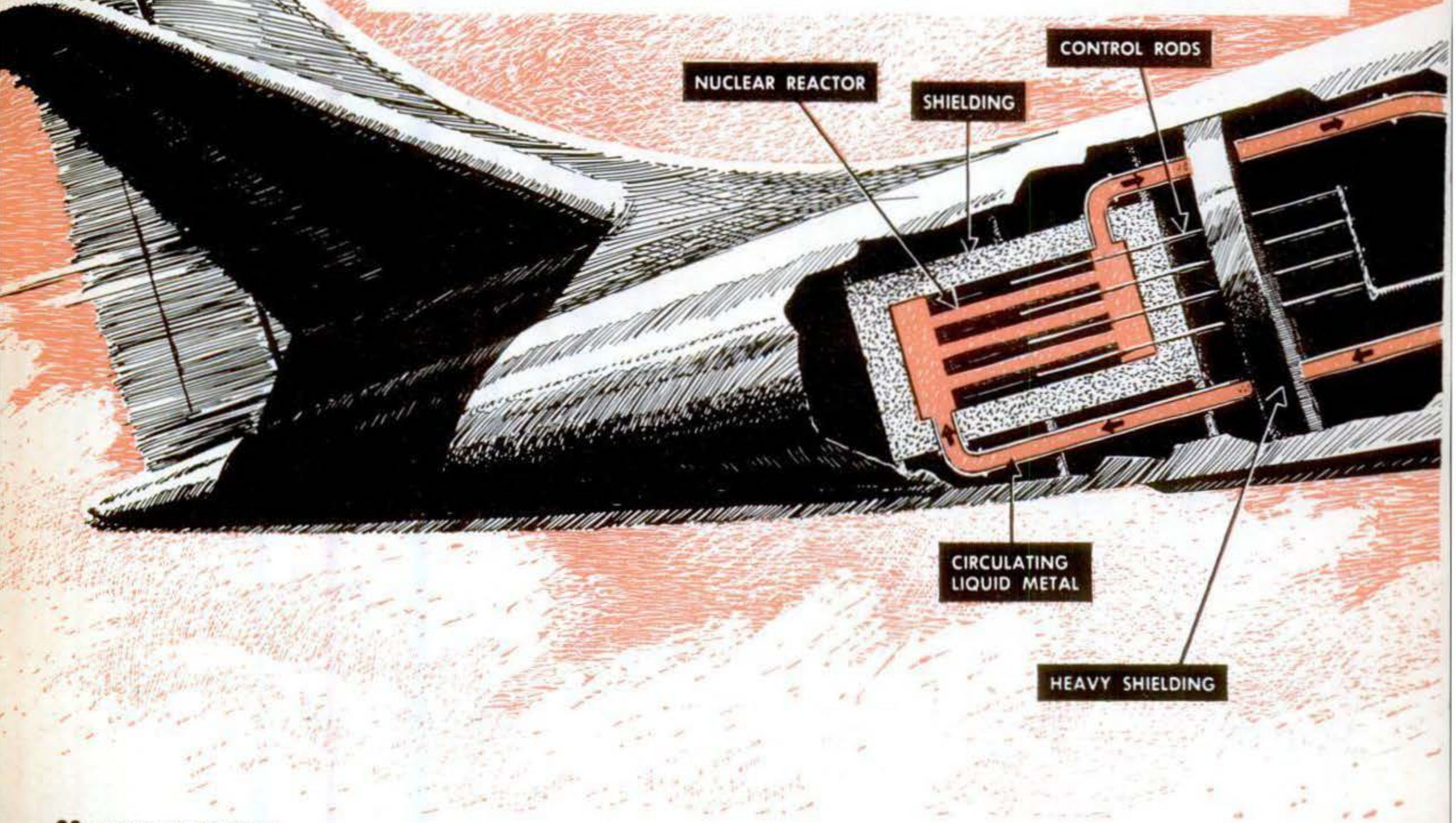
A new era in aviation approaches as official reports hint nuclear power for flying is closer than you think.

By Gerald Wendt

Author of "Atomic Energy and the Hydrogen Bomb"

THE first atomic-powered plane—already being designed—will be a big plane, probably a flying boat. It will have wide but thin wings to combine lift with high speed. It will have no fuel tanks, yet will be able to stay afloat almost indefinitely. It will run on steam. Its power plant will look a good deal like a yacht's, with a red-hot boiler and turbine engines geared to propellers.

Such a power plant can be built now. A long-range plane that



Copyrighted material

TURBINE
CONDENSER
RETURN LINE
VAPOR LINE
TO TURBINES
CONTROL MECHANISM
PUMP
HEAT EXCHANGER

can go to the other side of the earth and back again, or all the way around, without refueling, is needed now. And the time when atomic power will be used to extend the range of aircraft tremendously is drawing closer. A carefully worded report by the U. S. Atomic Energy Commission on progress in the first six months of 1951 makes this terse but significant announcement: "Development of reactors to propel military aircraft also advanced."

Squeezing a Pile in a Plane

Yet the first atom plane is unlikely to be either a long-range bomber or a transport plane. Instead, it will be a flying laboratory for the armed services. The power plant probably will be so heavy that it will use up all the weight—up to 50 tons—saved by omitting fuel. Thus the great advantage of atomic power, the increase in payload made possible by the almost weightless atomic fuel, will be sacrificed. Still, the plane will have unlimited range, a big step ahead.

Eventually, perhaps within 20 years, this plane will be followed by atomic jets, ramjets and even rockets. Nuclear reactors will be developed that can pour their vast energy directly into compressors, heating airstreams to such a flame temperature that they will have the thrust of a jet. But not yet. Not enough is known now about reactors at white heat, nor about the ability of air to wipe that heat off instantaneously at jet speed, nor about metals that can stand both the high temperature and the intense radiation.

Until such problems are solved, the reactor used in a plane must operate at relatively low temperature. It will pass its heat to a circulating liquid metal that will in turn pass the heat on to a heat-exchange unit. There a working fluid—mercury or water—will be vaporized to drive a turbine. Then the working fluid will be cooled in a condenser and pumped back to the heat exchanger. All this adds up to plenty of weight.

The reactor itself need not be big. Half an ounce of fissionable uranium (the kind that splits) or plutonium can furnish as much energy as the entire 17,000 gallons of fuel carried by the B-47 Stratojet. Less than a pound would be used up in a 50-hour flight around the globe. But neither fissionable uranium nor plutonium can be used in pure form.

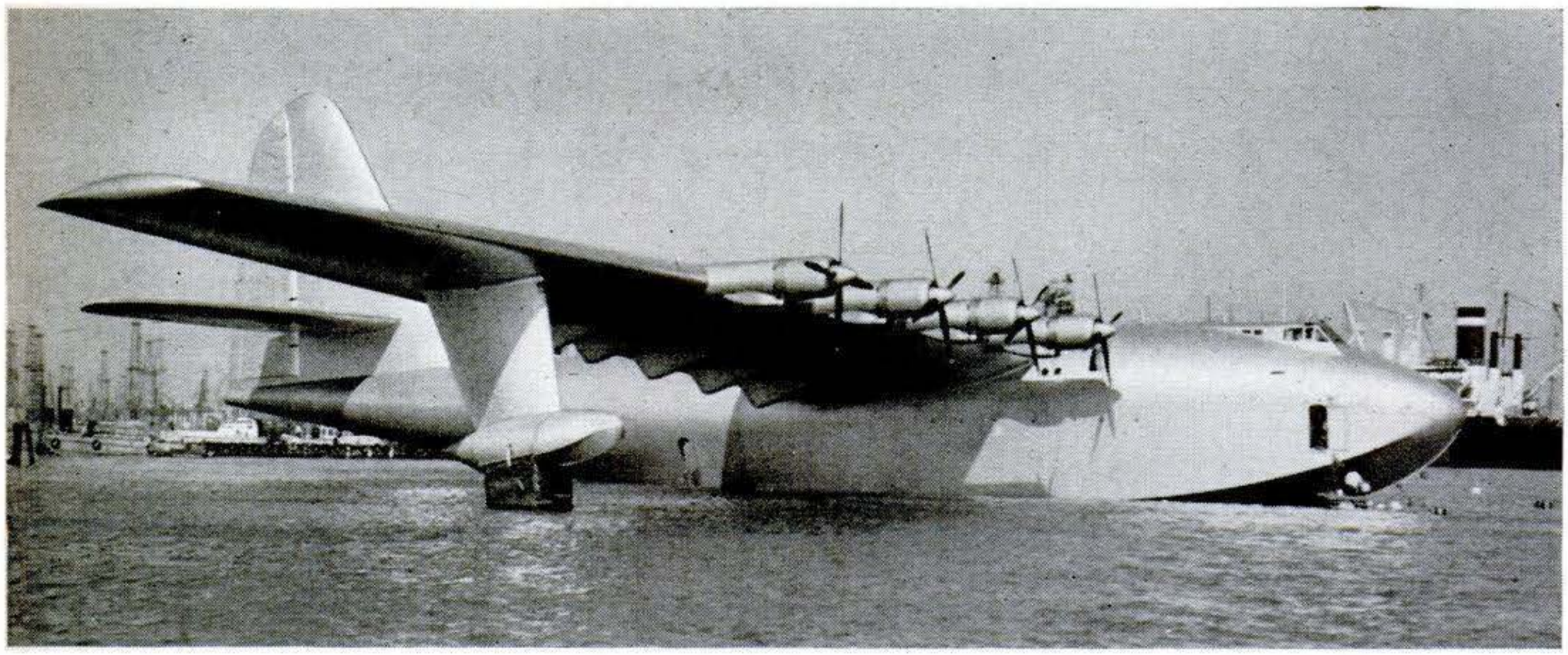
The bulk of the first reactor put into an airplane probably will be ordinary, nonfissionable uranium. This will be enriched with fissionable uranium 235 to permit the chain reaction. Graphite blocks or some other "moderator" will be needed, too, to slow down the fast neutrons and keep the "fire" burning. The generation of power may be controlled by cadmium rods, pulled out of the reactor when power and speed are wanted, pushed in to absorb the neutrons and "bank the fire" for slowed-down flight or landing. So the reactor alone will probably account for several hundred pounds.

Must Protect Crew

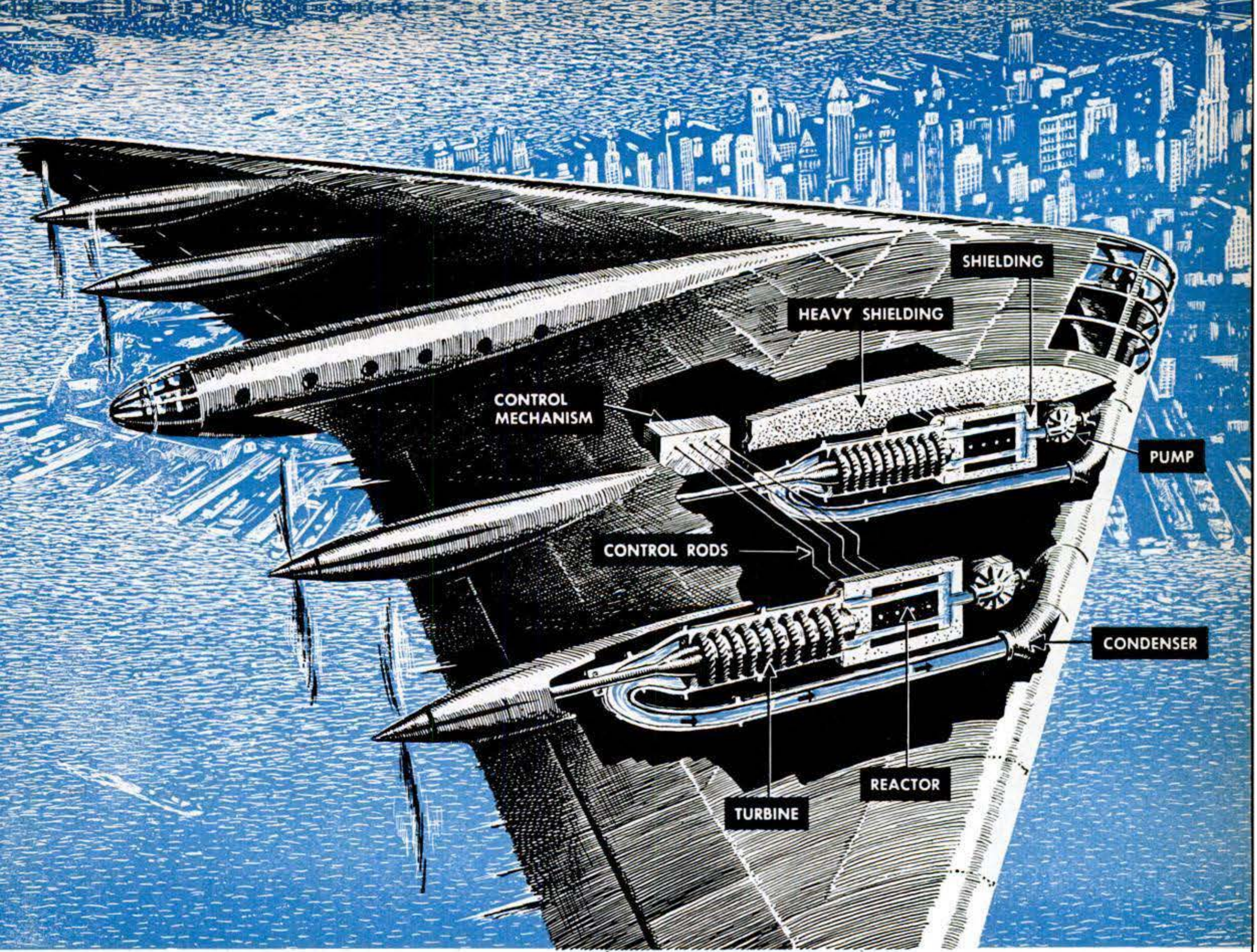
But the reactor only provides the heat. Transmitting the heat to the turbines will involve more equipment—and more weight.

It will not be possible to take the heat

Big flying boat is best bet for first atomic aircraft because of great size and long take-off run needed to lift heavily shielded reactor. It might be similar to world's largest plane, below, Howard Hughes' 219-ft. Hercules, which has four engines in each 160-ft. wing.



Copyrighted material



Future model could be a flying wing with separate reactor coupled directly to each turbine. Its design awaits development of materials able to withstand high heat and radiation.

from a reactor of the type now in use directly into the working fluid of turbines because of the enormous neutron and gamma-ray activity within the reactor. The working fluid which circulates through the plane to the engines in the wings must be protected from that bombardment or it will become radioactive and endanger the crew. But a heat-transfer fluid can be interposed, probably a low-melting alloy of sodium and potassium. This would circulate through the reactor to pick up the heat and deliver it to a heat exchanger where it, in turn, would heat the actual fluid used to operate the turbines.

Shielding Adds Weight

A reactor and heat exchanger of this type would be "hot" with radiation as well as in temperature, but might not pass the radioactivity on to the working fluid. Still, they would have to be encased in heavy and bulky shielding—probably lead—to stop the radiations from penetrating the plane.

From the heat exchanger in the shielded section, high-pressure vapor lines might carry the steam to six or eight turbines—one for each propeller—mounted in nacelles in the wings.

There the energy of atomic fission would be finally delivered and converted into motion. No shielding would be necessary, but the loss of temperature and pressure through the long lines would be a disadvantage.

This loss can be eliminated only when it becomes possible to provide each turbine with its own reactor, mounted alongside it in the wing.

Atomic Warm-Up Takes Time

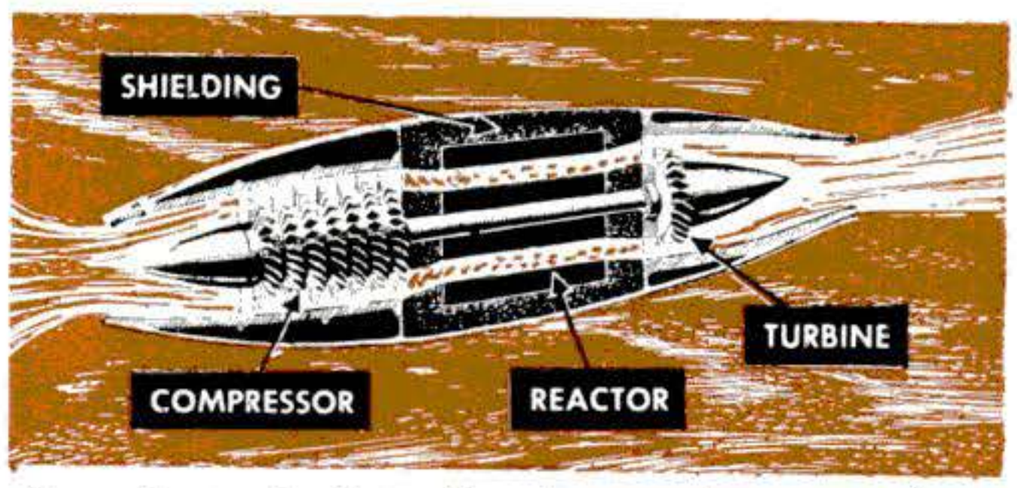
There also are other problems. The molten metal used as the primary heat-exchange liquid would solidify as it cooled when the reactor was shut down. The first step in bringing the plane to life would be to liquefy the metal with auxiliary heat, probably from a small gas turbine. Furthermore the metal would not be allowed to solidify throughout the system, but would have to be drained from the reactor, the heat exchanger and piping. In fact, the whole system would have to be purged of the liquid

Copyrighted material

metal, probably with hot helium gas (which does not react even with the molten alloy of sodium and potassium).

System Requires Automatic Control

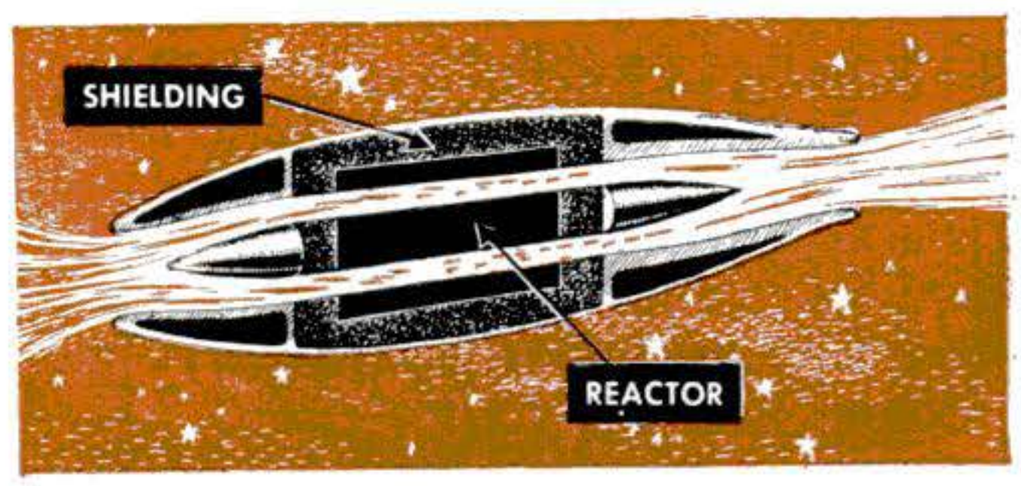
Obviously such a power system would be sensitive and complicated to operate. It could not be done by hand. The energy level of the nuclear reactor would depend on the position of the cadmium control rods. They would have to be precisely adjusted for every phase of take-off, flight and landing. The engines might be sluggish in their response to controls, for a change in the neutron release would first be converted to temperature in the reactor and, with so massive a power system, it would take quite a bit of time to translate that temperature into pressure on the turbines.



Atomic turbojet: Reactor replaces combustion chamber to heat air from compressor.

Automatic control by instruments that know what is going on within the heavily shielded power system would probably be used. Servomechanisms might be connected to electronic instruments that constantly measure the neutron flux within the reactor.

The delay in reaching full power would be a handicap on the take-off, when maximum power is most needed, and the plane would require a long runway—long enough, perhaps, to indicate a flying boat for the first experimental model. Booster rockets would help, but the take-off distance would still be great.



Atomic ramjet: Reactor heats stream of air compressed by plane's forward speed.

Once the great plane is airborne, however, it should operate smoothly and quietly at the highest speeds propellers can bite out of the air. And it should stay aloft for days.

First Flight Possible by 1960

Such a plane could be in operation by 1960. Since 1945 the NEPA Division (Nuclear Energy for the Propulsion of Aircraft) of the Fairchild Engine and Airplane Corporation has been at work on it under contract with the Air Force. Last February the Atomic Energy Commission announced that Fairchild had "completed its contract." This presumably meant that the feasibility of a nuclear airplane engine had been demonstrated.

Since then General Electric has said that its jet center at Lockland, Ohio, has started on an Air Force-AEC project for the "further development of an atom-powered engine for airplanes." The Air Force has made additional space available to the project in the huge World War II piston-engine plant at Lockland.

And this fall the Air Force awarded the contract for actual development of the atom plane to Consolidated Vultee Aircraft Corp., the firm that builds the giant B-36. The statement gave no other details. These official announcements can only mean that such a plane is very close to reality.

Actually, this pioneer plane will soon be obsolete. With reactor research work getting into full swing at Arco, Idaho, and at The Knolls at Schenectady, N. Y., it should soon be possible to use a "fast reactor" in place of the slow-neutron model. This may be so much smaller that it can be set into the wing.

Atomic Jets Forecast for 1980

Whether the heat exchanger and the enclosed system of circulating molten metal can be eliminated depends on many unknown factors. But certainly the objective will be to heat air directly in the reactor. Ideally the hot reactor would merely replace the flame in the airstream of a turbojet, with its heat providing the temperature and expansion to give the airstream the direct thrust needed for propulsion. This method of using atomic power in planes might come by 1980.

When it does, the nuclear engine should weigh but little more than present engines. Then, most of the tonnage saved by omitting gas tanks and gasoline can be used for payload. Doubling or tripling the payload will cut the cost per pound of air transportation to one-half or one-third of present costs of operation. And the new era in aviation will be here. END

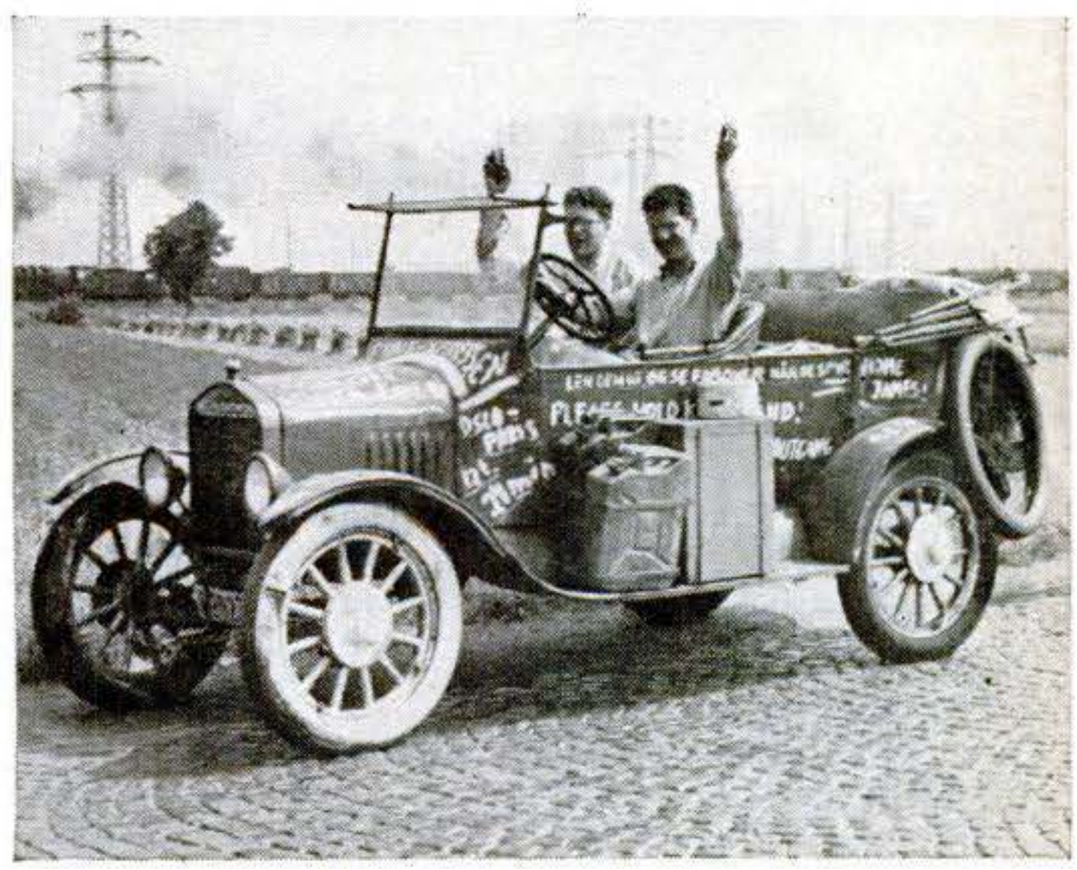
Copyrighted material

Tug Ducks Under Bridges

Low bridges don't bother this new tugboat—it just pulls in its pilot house. When approaching a span that's too low, the helmsman pulls a lever, and a pneumatically controlled hydraulic lift lowers the pilot house to deck level, as shown in inset. At the same time, the two masts fold over on hinges. After passing under, up come the pilot house and masts again. The 89-foot, 12,000-hp., General Motors Diesel vessel, designed for inland waterways, was built for the Blue Line of N. Y., by the Levingston Shipyard, of Orange, Texas.

Moving Prism Focuses 'Scope

THE Bausch and Lomb 60-mm. target-spotting telescope above uses a new method of focusing in which the instrument's prism moves, instead of the eye lenses. The focusing knob (arrow) is located for easy operation with the index finger. Greater speed and accuracy of focusing is said to result. Weighing 48 ounces, the new scope is available in four magnifications: 15, 20, 30, 60.



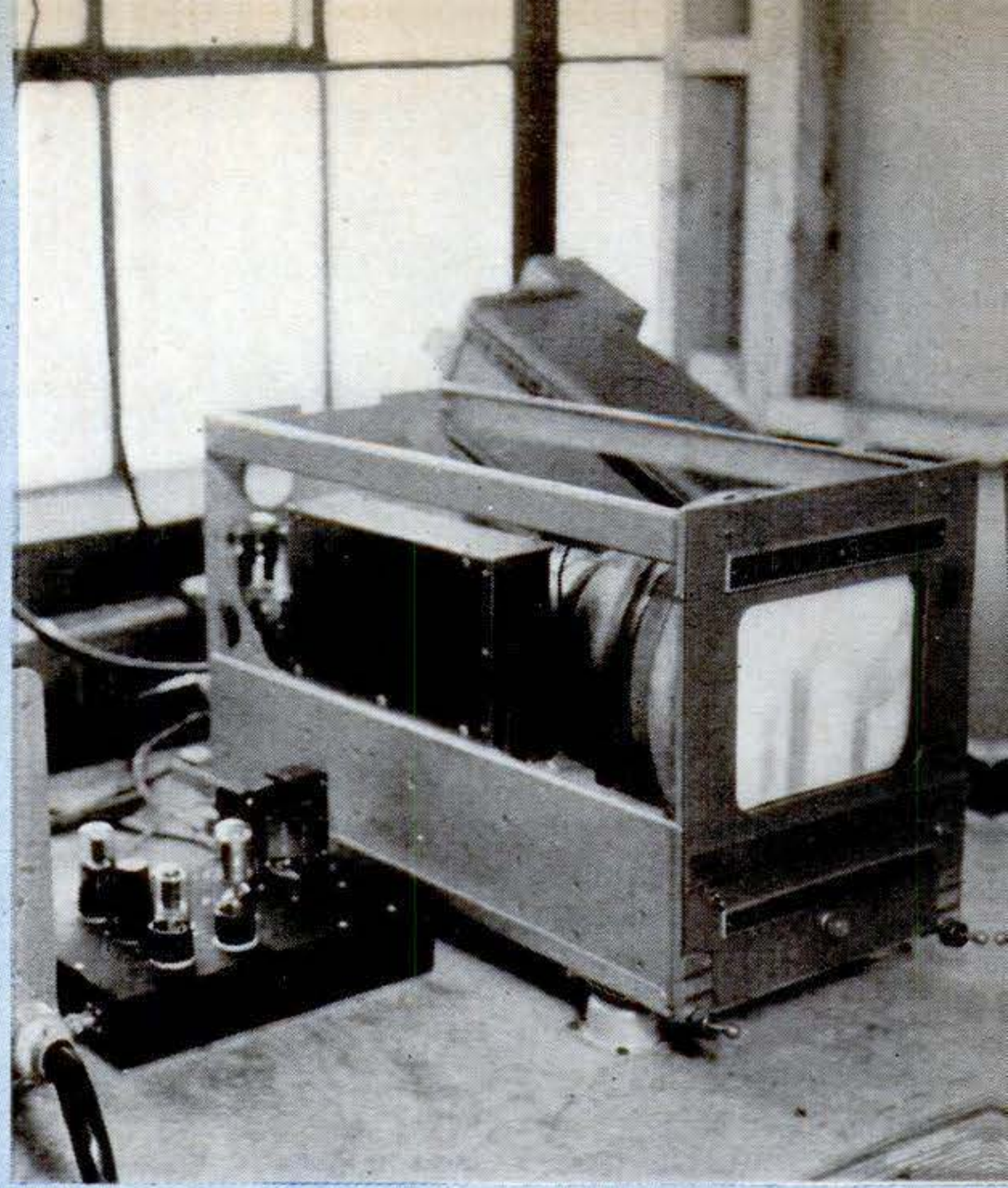
Model T Rolls on Straw

UNABLE to buy replacements for the worn-out inner tubes in the tires of their Model T Ford, these two Norwegian students came up with an ingenious solution: They threw away the tubes—and stuffed the casings with straw. How well it works is shown in this picture of them touring Western Germany on their way home from the Paris 2,000th anniversary celebration.

Copyrighted material

TV Keeps an Eye on Smoke

TELEVISION is helping New York cut down its smoke nuisance. Three huge stacks of the Consolidated Edison Company's Waterside generating station, located near the heart of metropolitan New York, can belch a lot of smoke if the boilers are not regulated properly. To keep their sooty output under control, the stacks are constantly televised. In the boiler control room deep underground, an operator watches a video viewing screen and makes adjustments as the picture calls his attention to any abnormal smoke conditions. The company also uses its own television setup to monitor the water level in drums located 90 feet above the control room. In this case, the televised image is a water gauge.

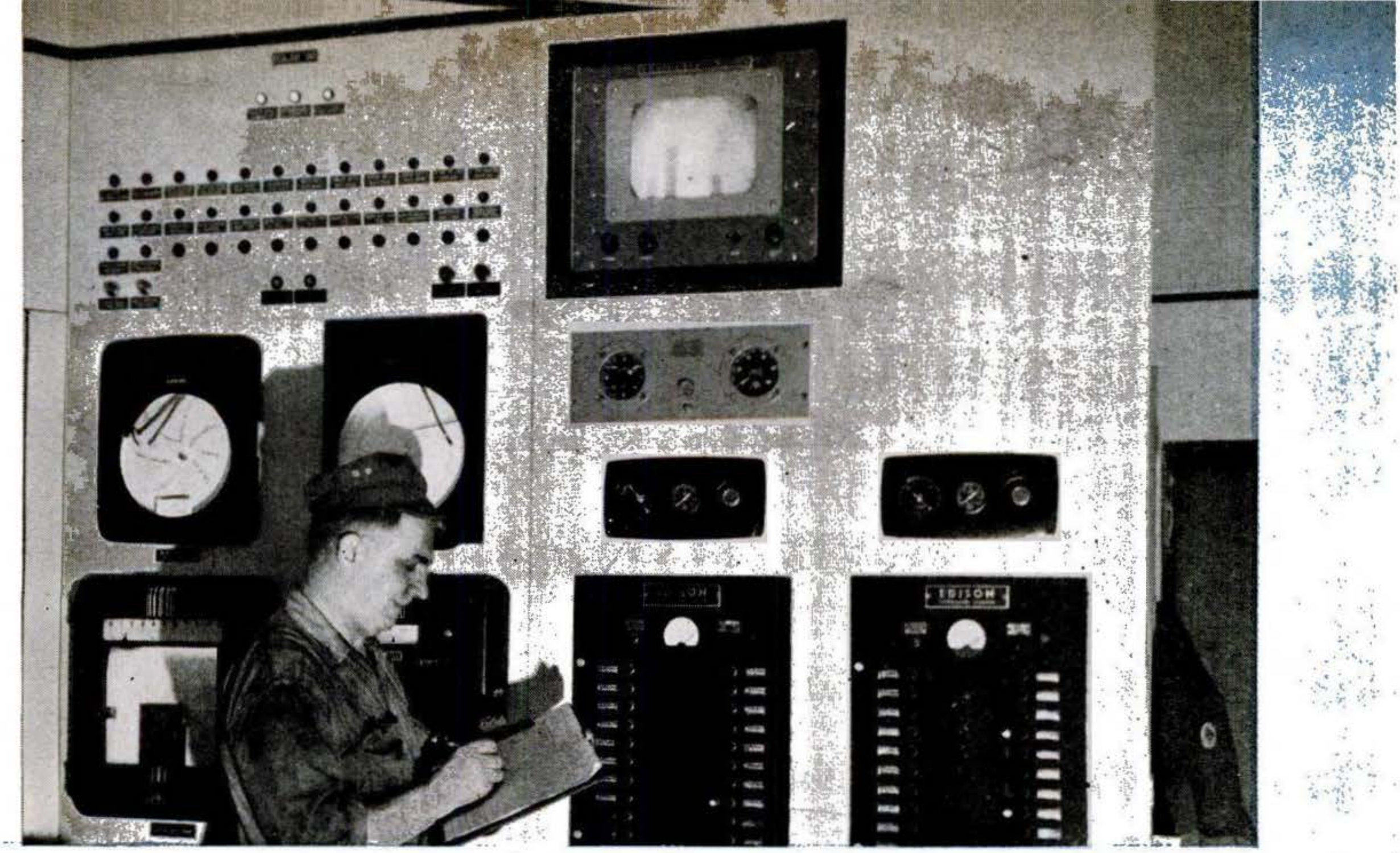


TV camera (at window in background) and monitor are in building four blocks from stacks.

400-M.P.H. Super Connie Tries Its Wings

STRETCHING its 123-foot wingspread over Southern California mountains, the new Lockheed Super Connie is shown in its first flight photo below. Its builders added 18 feet, 5 inches to its fuselage, for a total of 113 feet, 7 inches (PS, Jan. '51, p. 150). The new Constellation is the only U.S. transport built so that it can be fitted with increasingly powerful engines, from the latest reciprocating types to gas turbines driving propellers. Passenger version can accommodate from 47 to 93 persons, depending on seating plan; military type will seat up to 110. Added strength has been built into the new transport plane to take turboprop speeds in excess of 400 m.p.h.

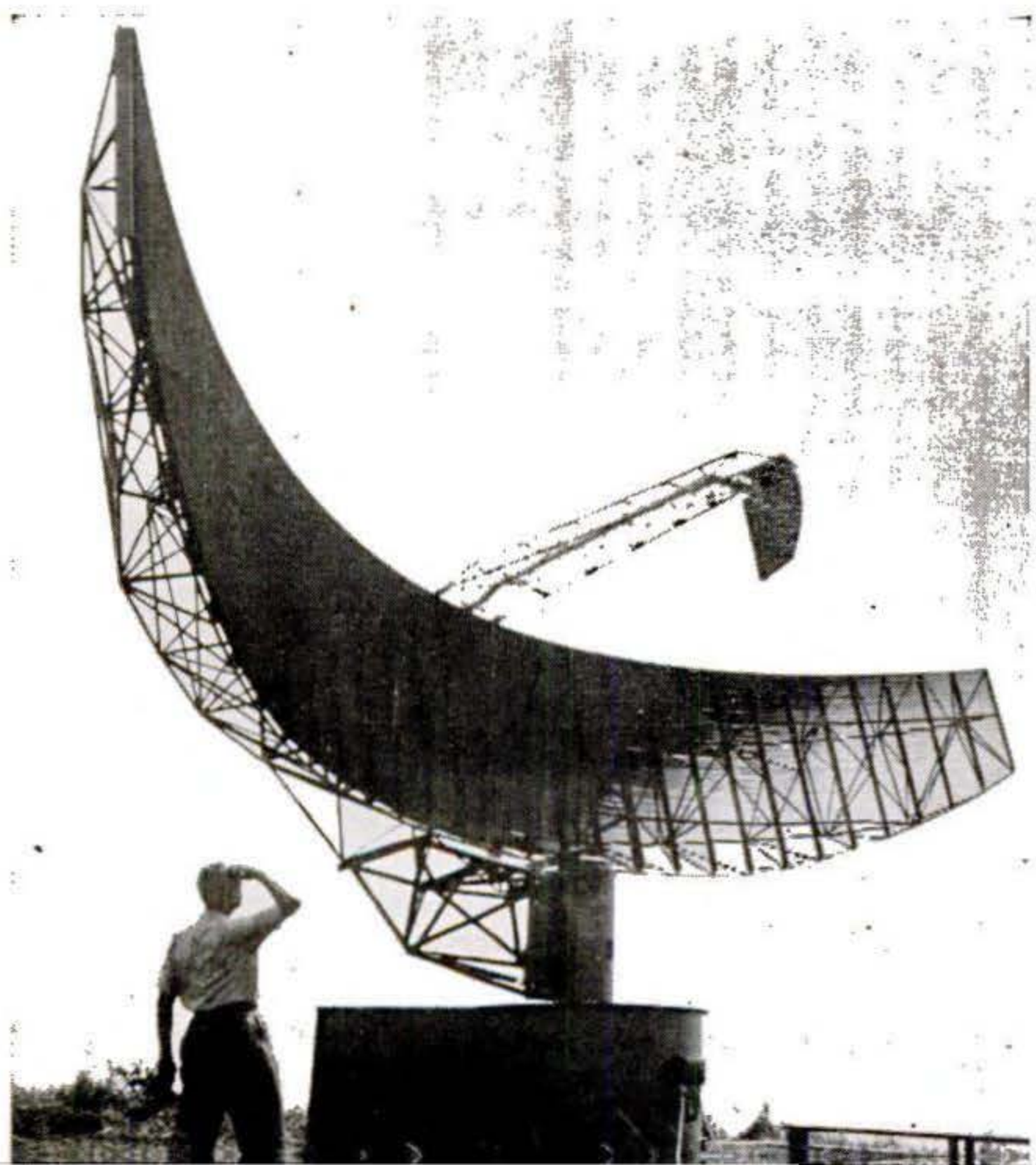
Copyrighted material



Viewing screen, connected to camera by coaxial cable, is located in boiler room 450 feet below top of stacks. By watching smoke output, operator can adjust boiler.

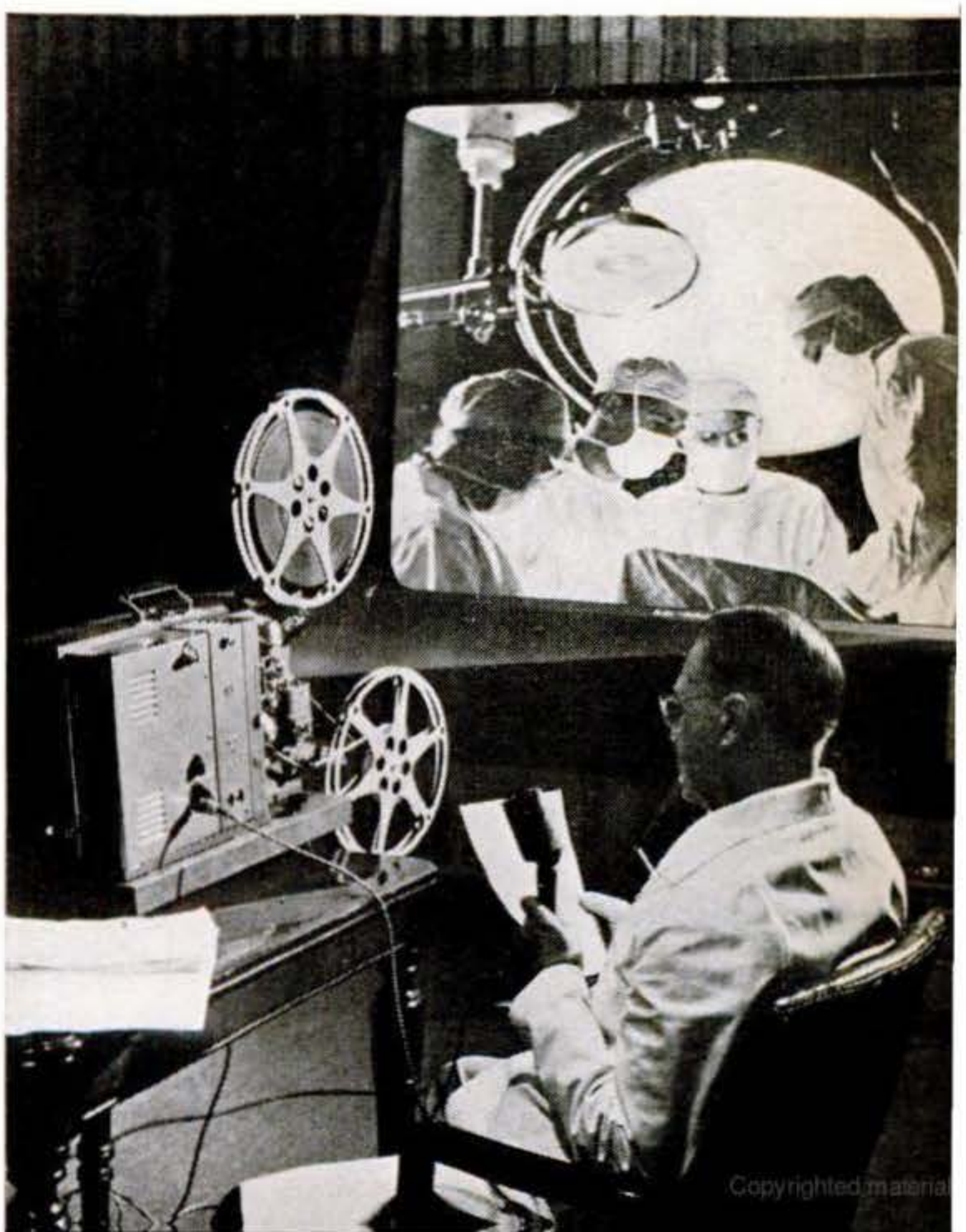
Radar to Scan French Harbor

THIS 40-foot-wide antenna is part of a U. S.-built radar system for the Port of Le Havre, France. Even in a 90-m.p.h. wind, it will make eight revolutions a minute, detecting any object of consequence in the harbor. When tested in Boston recently, scope operators picked up a 10-inch lobster-pot float that was two miles away.



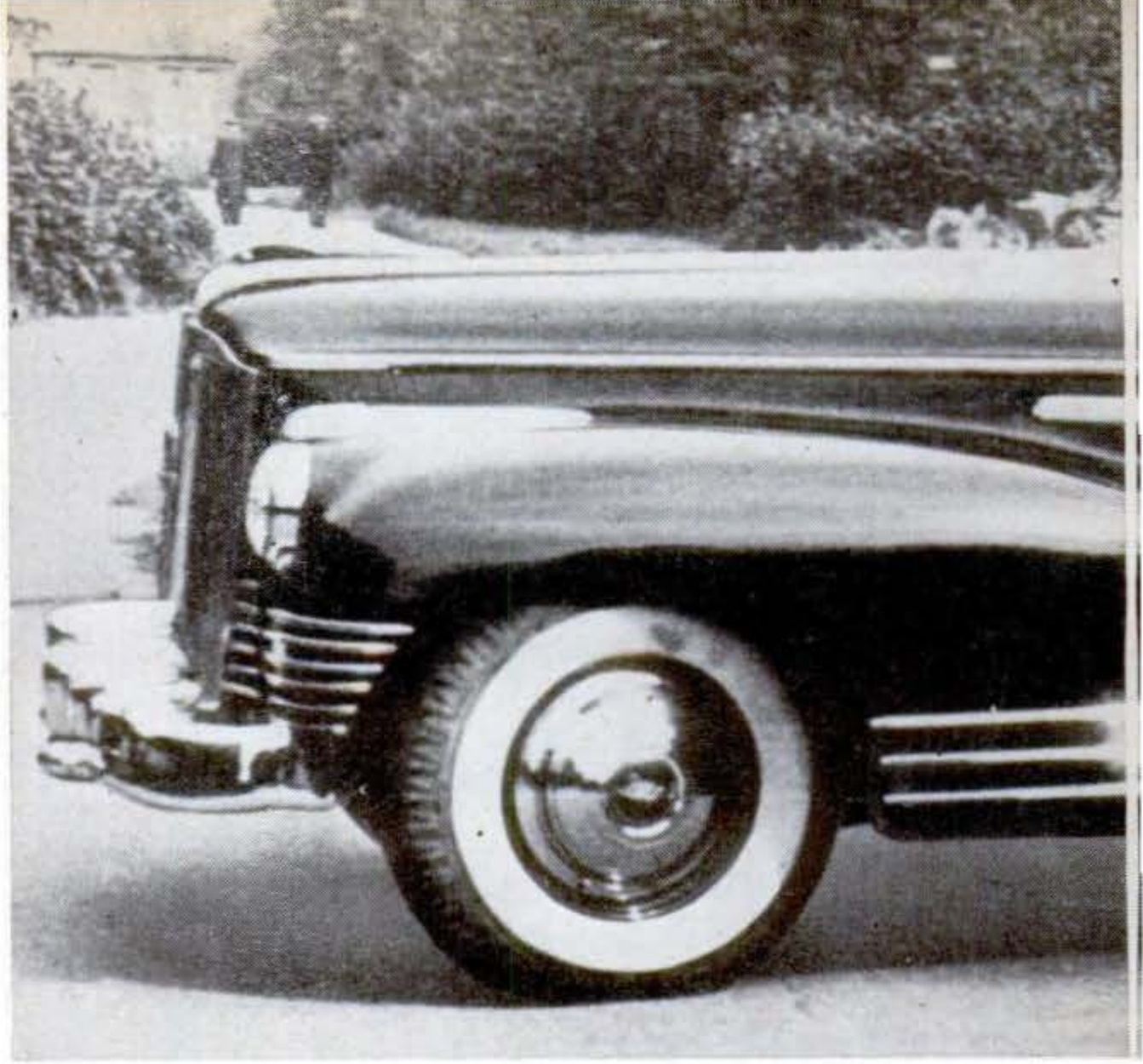
Projector Records Sound, Too

THE new 16-mm. movie projector below can record sound on film as it projects it. With this setup, a running commentary can be added to a movie—as this doctor, describing an operation, is doing—that was originally shot without sound. Made by RCA, the apparatus records sound magnetically on a strip at the film's edge.



Copyrighted material

ALL ABOUT RUSSIAN CARS



They're hard to come by—and when Ivan gets one he faces many of the same problems Dad did with his Locomobile.

By Hartley E. Howe

NEXT time a foreign-car hot-shot starts telling you about the new Javelin Jupiter or how many kilos he knocked off in a Lancia, just ask him what he thinks of the Pobeda (pronounced po-bee-yeh-da). Or how about the riding qualities of the Zim?

You've got him—unless he's been peeking behind the Iron Curtain—because these are Russian cars. This advertisement ran in *The New York Times* for nine days without bringing a single Russian car to light:

IMPORTED MOTOR CARS WANTED

RUSSIAN AUTOMOBILE wanted for rent or purchase. Must have been built in U. S. S. R. since 1949; now be available in North America. Z6816 Times.

But next month, one will be exhibited at the Los Angeles Motorama. It was captured in Korea.

And the Russians recently have started exporting cars to some countries—apparently to secure foreign exchange.

One of the few Russian cars to be allowed abroad is the Moskvich, which means Son of Moscow. It is an adopted son, however, for the Moskvich is almost identical with the German Opel Cadet of 1939. And so it should be: Opel machinery was shipped from Germany to Moscow as war reparations. Russian autos in general are about nine years behind their Western equivalents —a lag partly due to World War II and partly to the problems faced by the Soviet auto industry.

COMMISSAR'S CAR

The Moskvich, a four-seater, has a 102-inch wheelbase and is between a Crosley and a Willys in size. Two reporters from the British magazine *Motor* took a Moskvich four-door sedan out on a test spin. They reported that: "a modern single dry-plate clutch gives a naturally smooth getaway. Acceleration with a three-up load was adequate but not exciting on the partially run-in car we drove . . . The gears are all quiet, including reverse, middle ratio being useful up to 30 m.p.h. and allowing almost 40 m.p.h. to be attained . . ."

Moskvich Does Well on Bumps

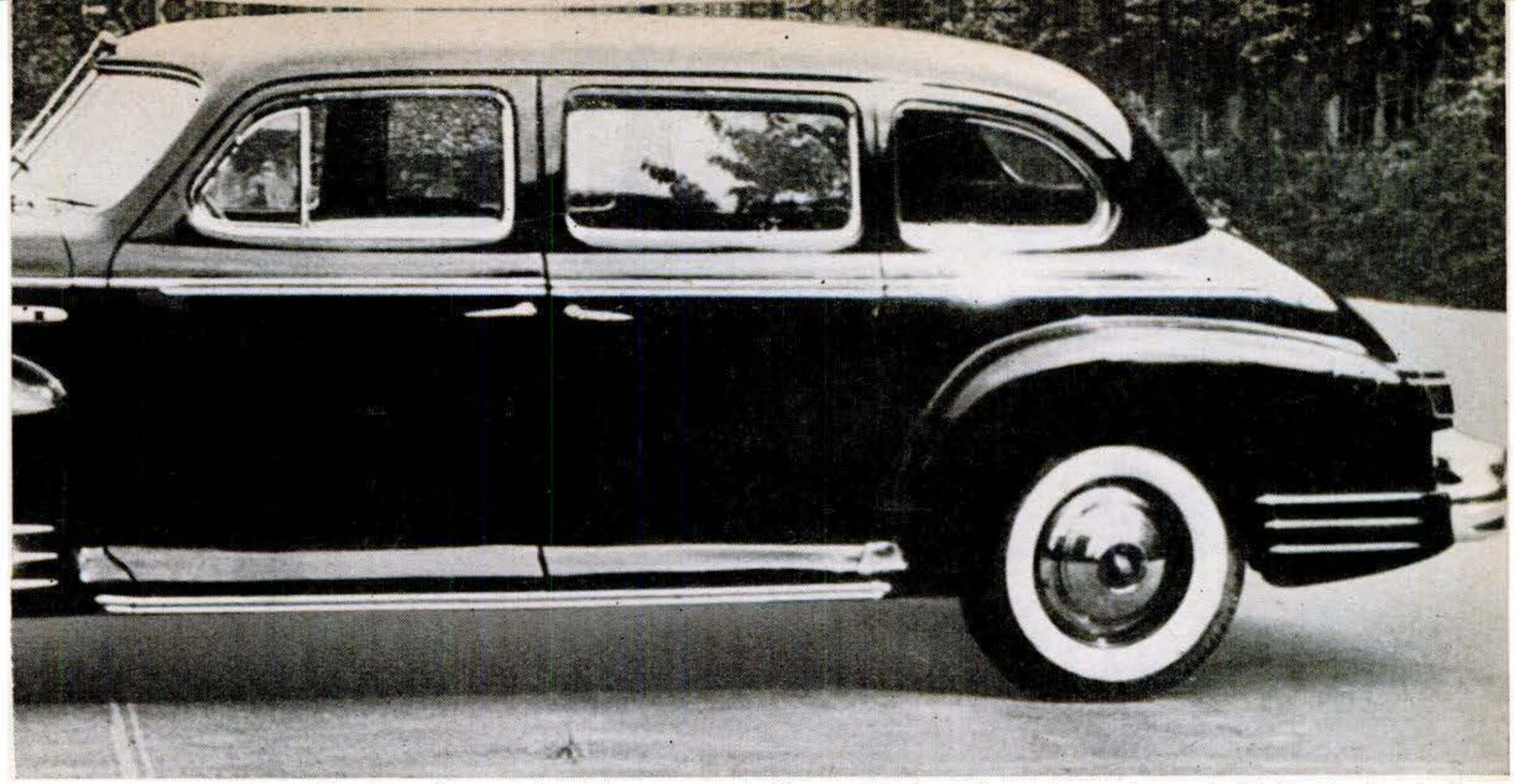
Its lightly damped, soft springs, they added, make "riding over bad surfaces . . . quite commendably free from shock, even for a rear-seat passenger. On sharp corners body roll can be induced but the car does not feel unstable."

Both the worm-and-wheel steering and the hydraulic brakes are quite unusually lacking in "feel," they reported, its "reasonably taut steering requiring conscious attention if the car is not to wander slightly on straight roads."

Criticism from Russian buyers about the quality of the Moskvich has been reported from Moscow, but *Motor* was critical only of the roughness of some of the body panels. The paint job was said to be good.

The car has an interior light, a glove compartment, ventilators in the front win-

Copyrighted material



Zis-110 is for big shots only. Name stands for Zavod [plant] Imeni [named after] Stalin. L-head engine turns out 140 hp. at 3,600 r.p.m., 20 hp. less than that of 1940 Packard from which it was copied. Maximum speed is 87 m.p.h.; mileage, 10.1 to the gallon.

dows, and dual windshield wipers driven from the engine. The instrument panel includes a fuel gauge, an oil-pressure gauge, a speedometer registering up to 120 km. an hour (about 75 m.p.h.) and a total-distance recorder. The luggage compartment is reached by pulling forward the back of the rear seat.

Distribution Center in Belgium

In Brussels, a major distribution center for Russian auto exports, the Moskvich costs roughly $980. A de luxe model costs about $200 more. These prices, say European auto experts, are below cost.

Reports from South America say Russia plans to sell the Moskvich there for even less—$840. U. S. cars sell there for twice their home price, so the Moskvich would cost half as much as our cheapest midget in South America; one-fourth the cheapest U. S. full-size car.

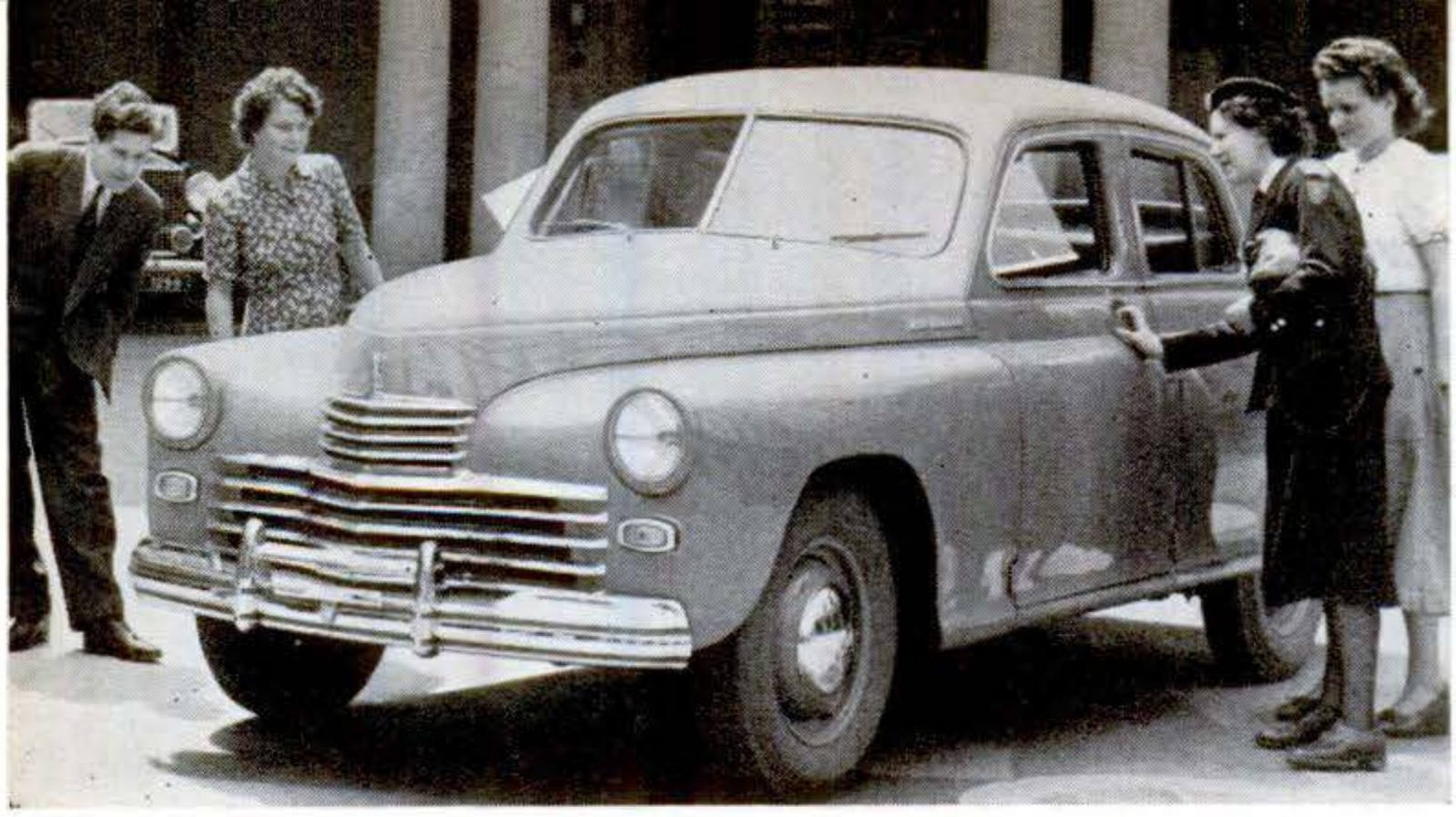
Other Russian passenger automobiles are the Pobeda, the Zim, and the Zis-110. Smallest is the five-seater Pobeda [Victory] that looks something like an early postwar Chevrolet. The engine is an adaptation of the Continental F4140, which appeared in this country in 1938. The transmission is a modification of the 1932 Ford B.

To improve durability and maintenance, both poor on prewar cars, the Pobeda uses cylinder liners and exhaust-valve inserts. The car also has forced crankcase ventilation, force-splash lubrication and a conventional by-pass oil-filter system. The

NEWEST MODEL

Zim—or "works named after Molotov"—is latest USSR car, aims to provide luxury at lower cost than Zis. Six-cylinder engine is rated at 95 hp. at 3,600 r.p.m., provides a top speed of about 80 m.p.h., gets about 12.5 miles to the gallon. Windshield wipers are electric. It's equipped with radio and heater. The Zim is manufactured at the Molotov plant in Gorki.

Copyrighted material



FAMILY CAR

Pobeda [Victory] comes as five-passenger sedan or cabriolet. Four-cylinder engine develops 50 hp. at 3,600 r.p.m., provides 68-m.p.h. top speed, gets 19.5-23 miles to the gallon. Car weighs 2,926 lb., has a 106-inch wheelbase. Its heater is important item in Russian winter.

wheels are suspended independently; brakes are hydraulic.

The next larger Russian car, closely resembling a Buick in appearance, is also the newest, the six-passenger Zim. It is described by the Russians themselves as fast, highly maneuverable and with good road qualities. Other characteristics include independent front-wheel suspension with helical springs, and fluid drive.

Russian Zis Resembles Packard

The fourth Soviet passenger auto, the biggest, is available only to top-drawer commissars. Called the Zis-110, it is an adaptation of the Packard Custom Super Eight 1808, the 1940 model, but minimum tolerances are reported to be .002 to .004 inches, noticeably larger than the Packard's. It carries seven passengers, and also comes as a touring car. The windows have push-button controls.

How much does a Russian pay for one of these cars? Well, he probably can't buy the Zis at all; the only way he can get one is to rise in the Soviet bureaucracy until he reaches a job with a Zis built in. In 1949, the Moskvich was advertised in Russia for 9,000 rubles and the Pobeda for 16,000. More recent reports quote the Moskvich at 8,000 and the Pobeda at 12,000. Figuring the buying power of the ruble in Russia at five cents, the last-mentioned prices would be $400 and $600. Using the Soviet's official exchange rate, 25 cents, however, they would be $2,000 and $3,000. The average monthly pay of a Soviet worker is only 620 rubles, so that it would take him 13 months' work to earn the cheapest car. However, skilled workers sometimes make five times the average rate.

American experts feel the cars are priced low in relation to other Russian luxuries—less than six times as much as a good suit, for example. Coupled with the tiny production rate, this makes them suspect that the sales price is arbitrary and that the cars are really used as rewards.

The cars are sold for cash, and it isn't easy to save up the money—all savings were sharply cut in 1947 by currency manipulation. Nevertheless no glut seems likely.

The 1950 production goal under the Third Five Year Plan was 72,000 units. We don't know if they made it, but one Soviet report gives 1950 production as 141 percent of 1949, which would make 1950 only 28,200 cars. That year the United States made 6,672,700 passenger cars. The Soviet planned to make six times as many trucks as autos, however, while here we made five times as many cars as trucks.

Only a Few Sales Agencies

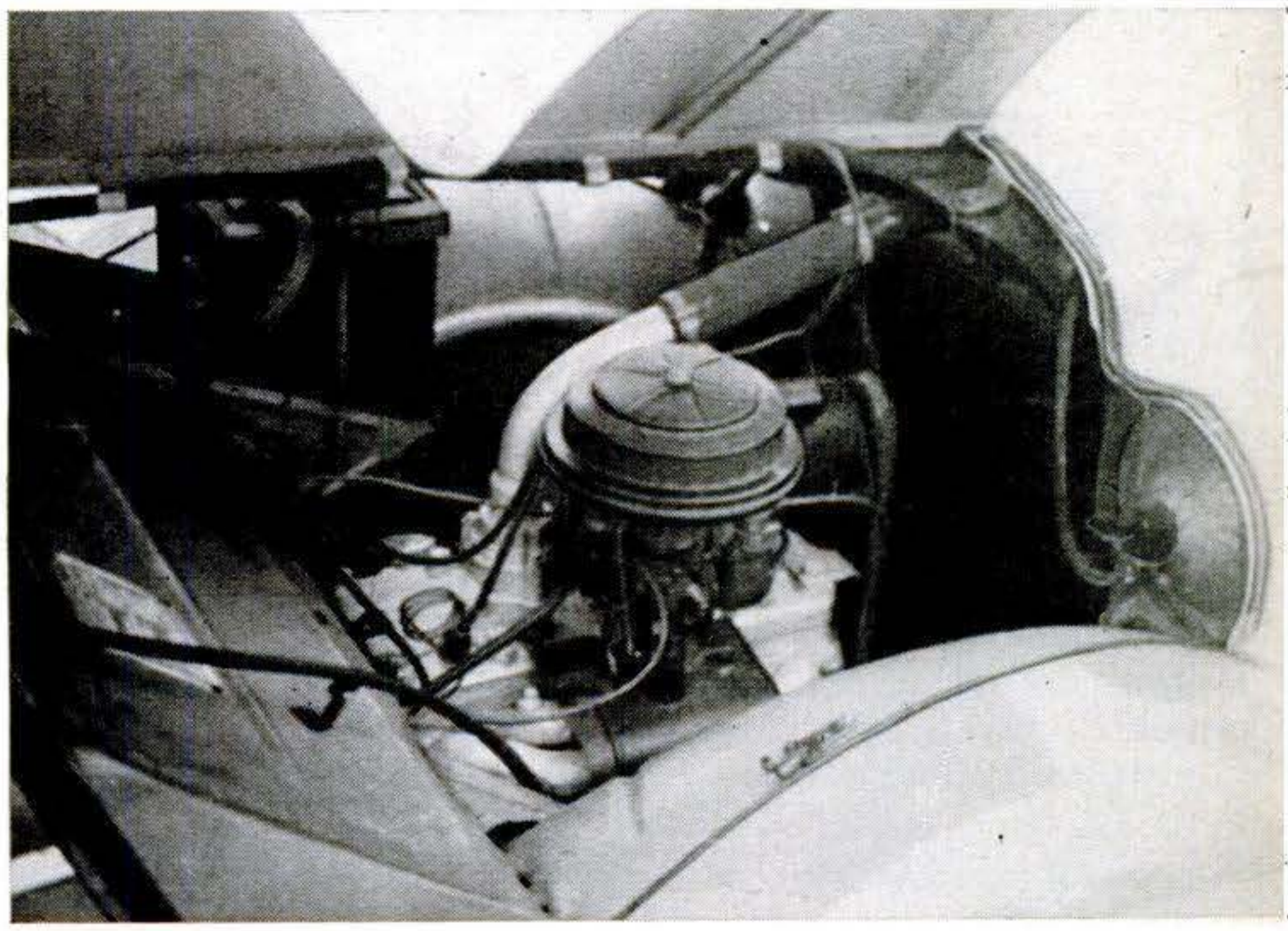
There are reported to be 16 retail auto-sales agencies in the USSR—a tiny number for such a huge country. City department stores take orders, but from Russian accounts many people travel long distances to Moscow to order an automobile at one of the beautifully decorated marble showrooms. A Moscow salesgirl, Miss Suslina, reported that her store sold 15 to 18 cars a day, and a total of more than 7,200 to individuals in the "past two years and more." That's a big chunk of the entire Russian output for that period.

After a Soviet citizen successfully saves his money, gets the nod from the party boss, finds a salesroom and proudly drives away in his new car, he finds that his problems have only begun. He's likely to have the

Copyrighted material

MIDGET

Moskvich station wagon, above, is very popular in Russia. Car also comes as four-door sedan. Four cylinder engine, right, turns out 24 hp. at 3,400 r.p.m. to provide 45 m.p.h. cruising speed, 56 maximum. Fuel consumption is reported 30 miles to the gallon. Unsynchronized shift provides three speeds forward, plus reverse; gearshift lever and hand brake are on the floor in center. In picture at right, battery is at top left; downdraft carburetor is at the right of the engine.



same troubles now that your Dad did when he bought his first Locomobile.

For one thing, autos are still so rare that there is little chance to learn to drive. As one man wrote to *Pravda:* "The need to issue detailed illustrated handbooks which are comprehensively written is perfectly obvious. However, the car factories supply owners with too-brief instructions."

The same letter went on:

"Owners of private vehicles have not the opportunity of obtaining the spare parts for them. The supply of car parts by post has not been organized. Cases in which because of defective spark plugs, wear and tear on the piston rings, condenser leaks, and other minor defects, owners are deprived of the opportunity of using their cars and motorcycles are not infrequent."

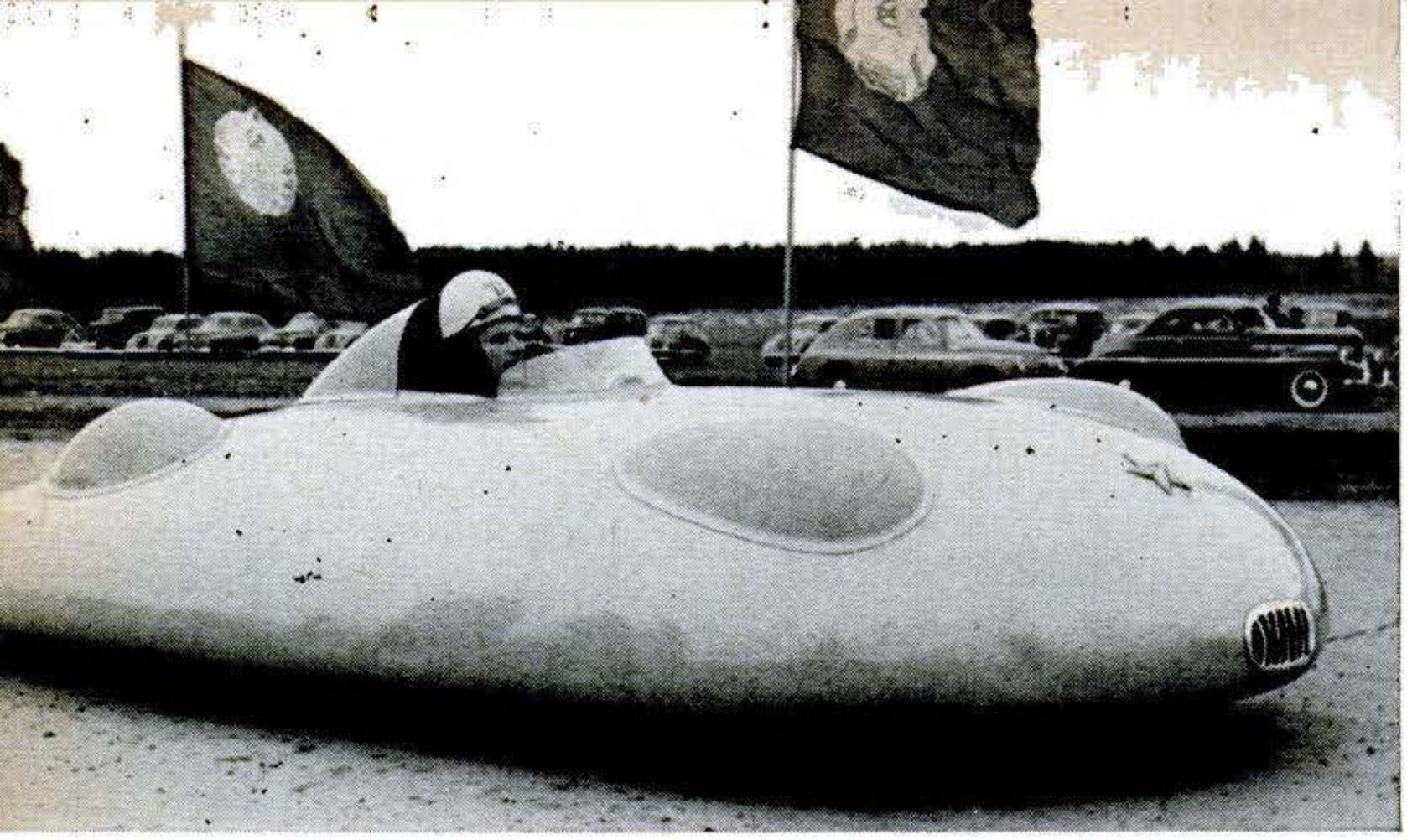
Then comes a most revealing complaint: "It is not easy to buy petrol and oil. Thus because of the lack of petrol and oil my Moskvich is off the road."

Repairs Are a Problem

The repair problem is really tough. An article in *Izvestia* this past winter noted that despite the increased number of car owners "nothing is being done in the district for the servicing of private cars.

"In a city as big as Stalino the repair of motor tyres is a complex problem. Before

Copyrighted material



RACING CAR

Svezda [Star] is Soviet sports racer. This is Model III, shown with "Master of Sports" Pavel Baranov at the wheel. According to the Moscow radio in 1949, the racer weighs 900 pounds, goes 102 m.p.h. Its engine is rated at 54 horsepower. The car is made from parts of the Moskvich and the M-72 motorcycle.

last summer there was a public vulcanization workshop in one of the artels [producers' cooperatives]. Now it is closed. Car and motorcycle owners are compelled to make private arrangements for tyre repairs with workers in garages where there is vulcanization equipment.

No Service Stations

"It is the same with car repairs. There are no workshops in any of the towns in the oblast [region] prepared to accept cars . . . from citizens for repairs." Service stations have been suggested for two years, the writer adds, but there still isn't a one.

Once you've learned to drive and maintain your car in Russia, found a garage, a mechanic, and a man to fix flats in his spare time, and discovered a place to buy gasoline, you face the problem of where to drive. There's plenty of room but few paved roads. On an 8,000-kilometer test run of the Zim, the cars crossed shallow streams and roads flooded after heavy rains. The Zims averaged 36 to 42 m.p.h. over asphalt roads and only 24 m.p.h. on mountain roads. It's not surprising that soft springing is emphasized on all Soviet passenger autos.

Comparatively primitive conditions turn up repeatedly in the whole picture of motor transport in Russia. In Soviet auto factories production is inefficient with high overhead and low output per worker. In 1947 casting rejects ran as high as one out of every four or five. Tires frequently last only 1,000 miles: while some may go as far as 9,000, others last only 90!

Short vehicle life and high operating costs reflect this situation. In 1937 only 55 to 60 percent of the motor vehicles in the Soviet Union were in running condition at any one time, and things were reported no better in 1948. In 1947, it is estimated, it took one man 200 days' work to keep one truck running for a year.

Poor manufacturing quality isn't the only cause of these troubles—Lend-Lease trucks wore out quickly in Russia too. Bad roads and a terrific climate are partly to blame, but inadequate maintenance and poor quality gasoline and lubricants are a major cause. The Russians are struggling to overcome these handicaps. The new cars are designed for longer life with such features as winter preheating devices, removable main bearings, and fuel, air and oil filters. Preventative maintenance is being taught. Gasoline and lubricants are improving, although standards are still low. Difficulties in making good gasoline have led to considerable research into engines burning natural gas or liquefied butane—propane.

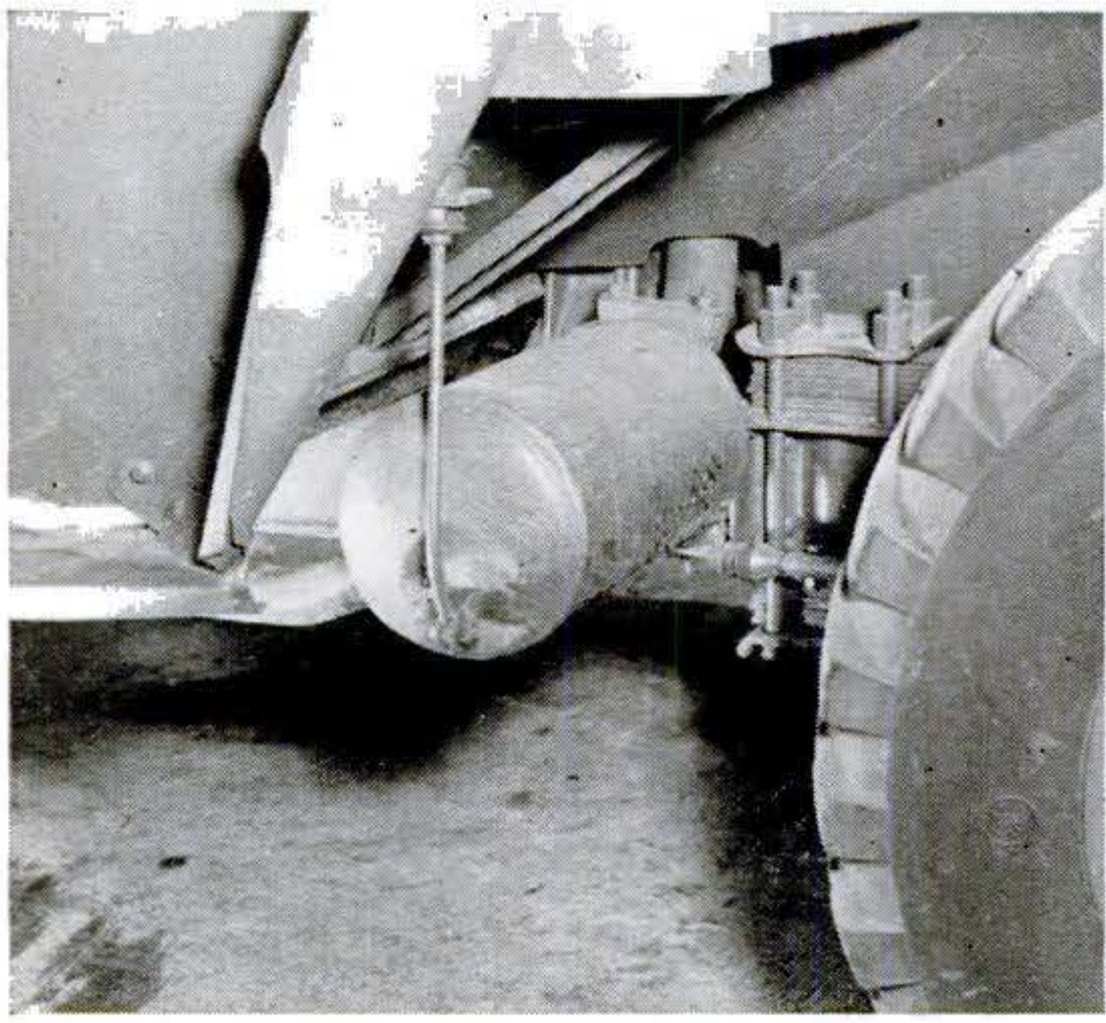
Raising factory standards is a herculean job. A returned German prisoner of war who worked in the Moskvich factory reported that "all around the machines waste is heaped, and . . . it has been left there for several days . . . The worker's mind and sense of duty are not quite as organized as you might be used to from Western plants.

Presses Overloaded

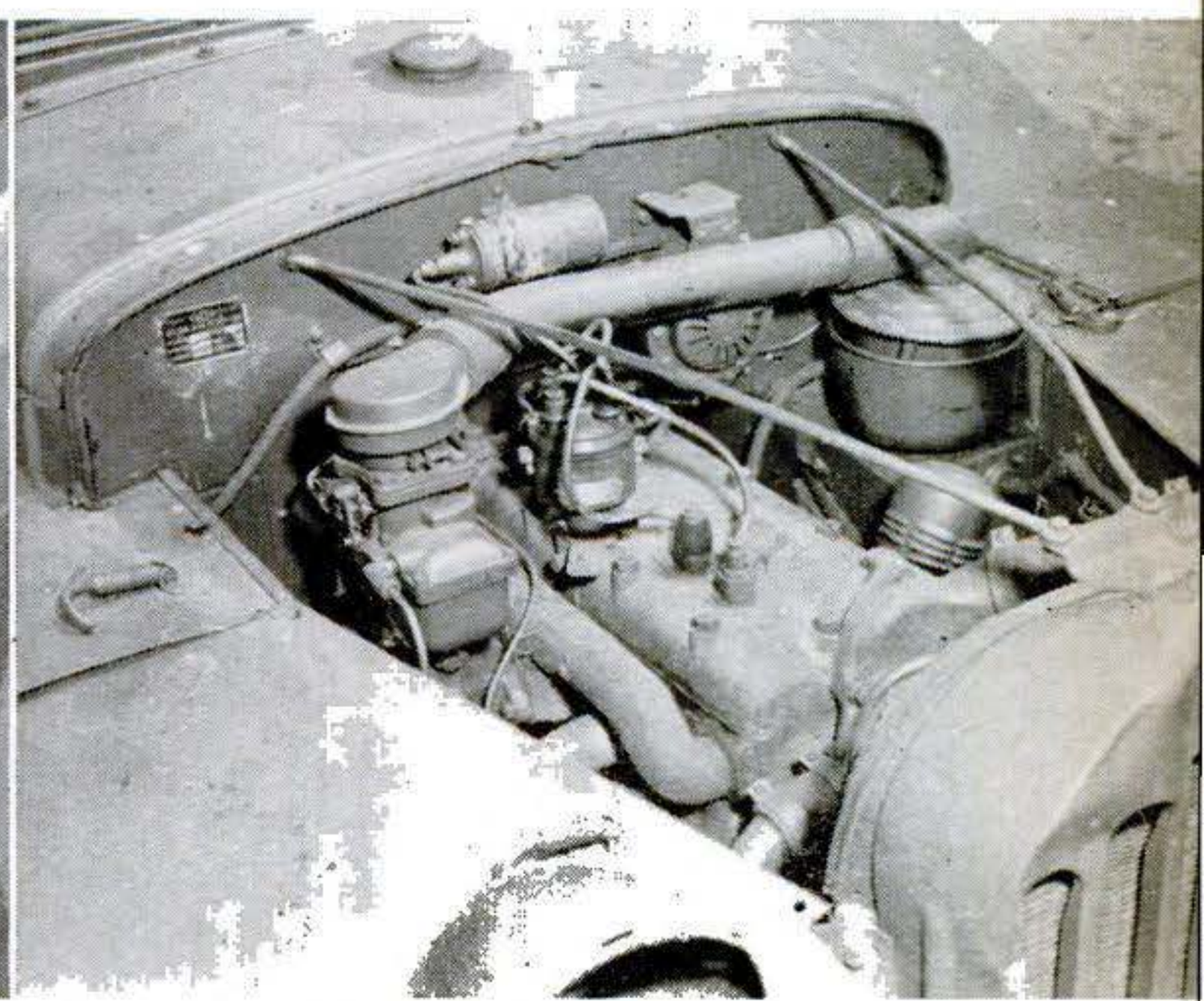
"The presses that shaped the enormous sheet-metal squares into fenders . . . and other parts one day may be so overloaded that the material piles up in veritable mountains, making it impossible even to look from one station to another. A

Copyrighted material

"JEEP" **Russian-made jeep,** captured in Korea, is one of two USSR passenger vehicles found in this country. It resembles U. S. jeep (right, above) in general appearance, but is more crudely made. Most of body can be shaped with simple hand tools, then roughly welded. Ribbing for strength, found all over U. S. jeep, is kept at minimum to avoid press work. Soviet car is unreliable and less agile —ask Pfc. E. W. Street, shown at wheel. When he was cut off by a road block during ill-fated retreat from Taejon in summer of '50, Street tried to break through in abandoned enemy jeep, but it quit on him repeatedly.



Exhaust receiver with baffle, just behind right front wheel, is typical of simplified equipment used on Russian jeep. It allows the exhaust gases to expand and muffles them slightly.



Engine in Russian jeep is similar to Fordson tractor engine, but distributor is like Mallory. It has a fuel pump. Gears are non-hypoid; front and rear axles resemble Ford Model A.

'norm' is on the way. The waste is hurriedly pushed over to any open space . . .the next day workers are very busy carting away the dirt. It would be impossible to go on producing for nobody can move . . . This means that the management or the foremen must possess the gift of improvising more than in any other country . . .

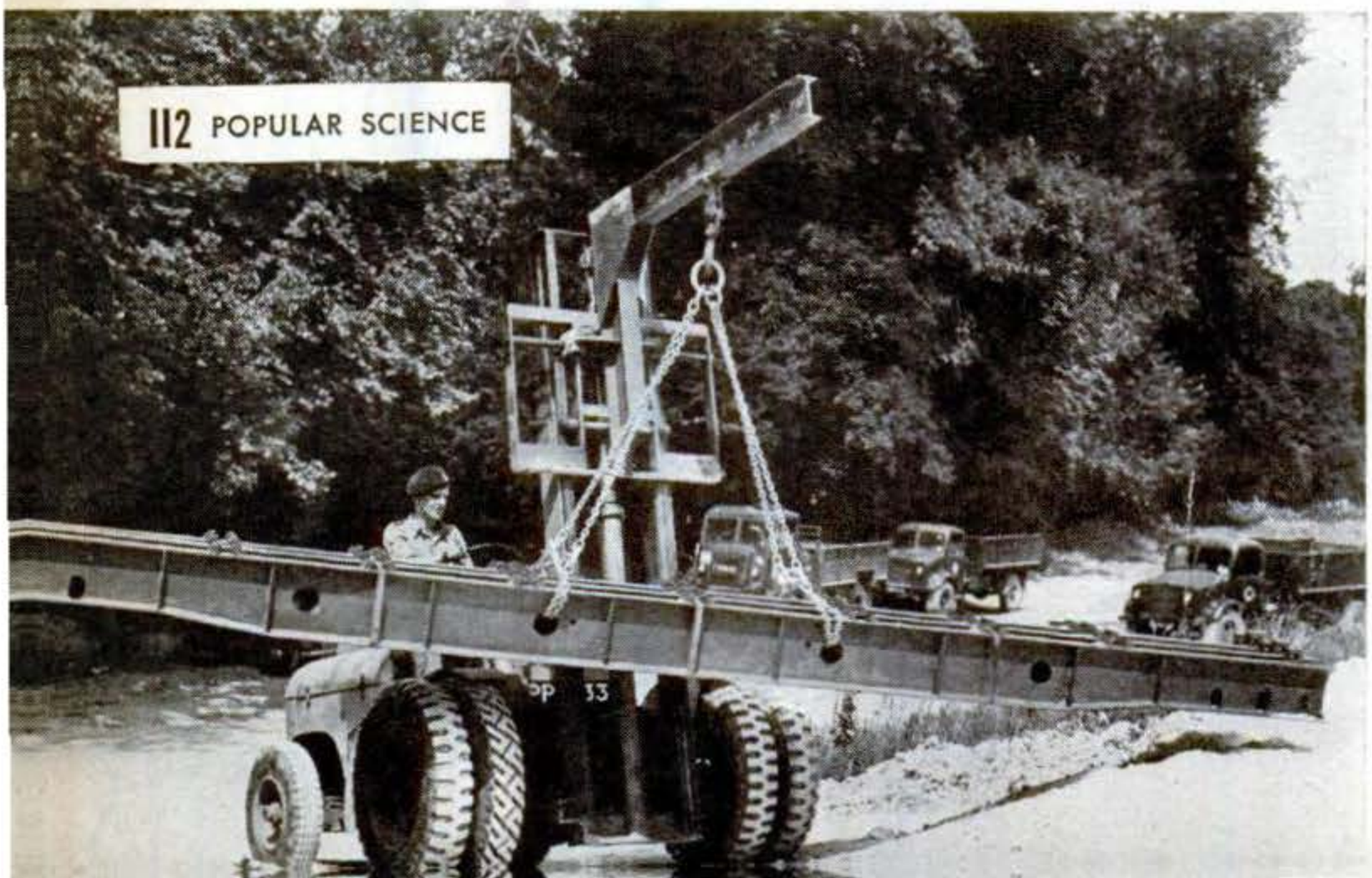
"Here you have to think in the Russian way: 'Nitschevo, we will muddle through, Daddy State pays for all'."

[Continued on page 302]

Valve under dash enables driver to change from gas tank in the cowl to second tank under his seat. Note easily serviced gas filter at right. Instruments, upper left, are like Model A's.

War-Weary Planes Wind Up as Sitting-Duck Targets

THE B-17 Flying Fortress above is giving its last performance as it "flies" through an antiaircraft barrage simulated by machine-gun fire and explosive charges fired under controlled conditions. The purpose of this unique shooting gallery at the Aberdeen Proving Ground in Maryland is to study the effect of battle damage on fighting planes under controlled conditions. Planes, from 40-ton bombers to fighters, all war-weary veterans on their way to the scrap heap, are hooked onto a steel cable between two 125-foot towers and raised to the desired height by an electric winch. They also can be suspended by the tail or nose to simulate various flight conditions.



Fork Lift Speeds Bridge Building

THE British army has borrowed the factory fork lift to build bridges. Designed to aid in erecting the famous Bailey bridges that helped transport Allied troops across Europe this one (left) easily handles a 2,800-pound bridge section. Maximum load is two tons.

Copyrighted material

New Streamlined Steel Plant to Be World's Most Modern

By George H. Waltz, Jr.

AS YOU read this, 8,000 construction workers are rushing to complete a steel plant that will bolster our steel stockpiles for military and civilian needs by almost 2,000,000 tons of ingots a year. When finished in 1952, it will be the world's most modern steel works and the largest integrated steel-producing unit ever constructed at one time.

Covering more than 3,800 acres, the new $400,000,000 steel center, to be known as the Fairless Works of the United States Steel Co., is being built near Morrisville, Pa., on the Delaware River.

Its battery of blast furnaces—two of the largest in the world—

Crane boom towering more than 200 feet hoists structural steel for "stoves" of blast furnaces that will be heart of giant new U. S. Steel plant along the banks of the Delaware River.

Copyrighted Material

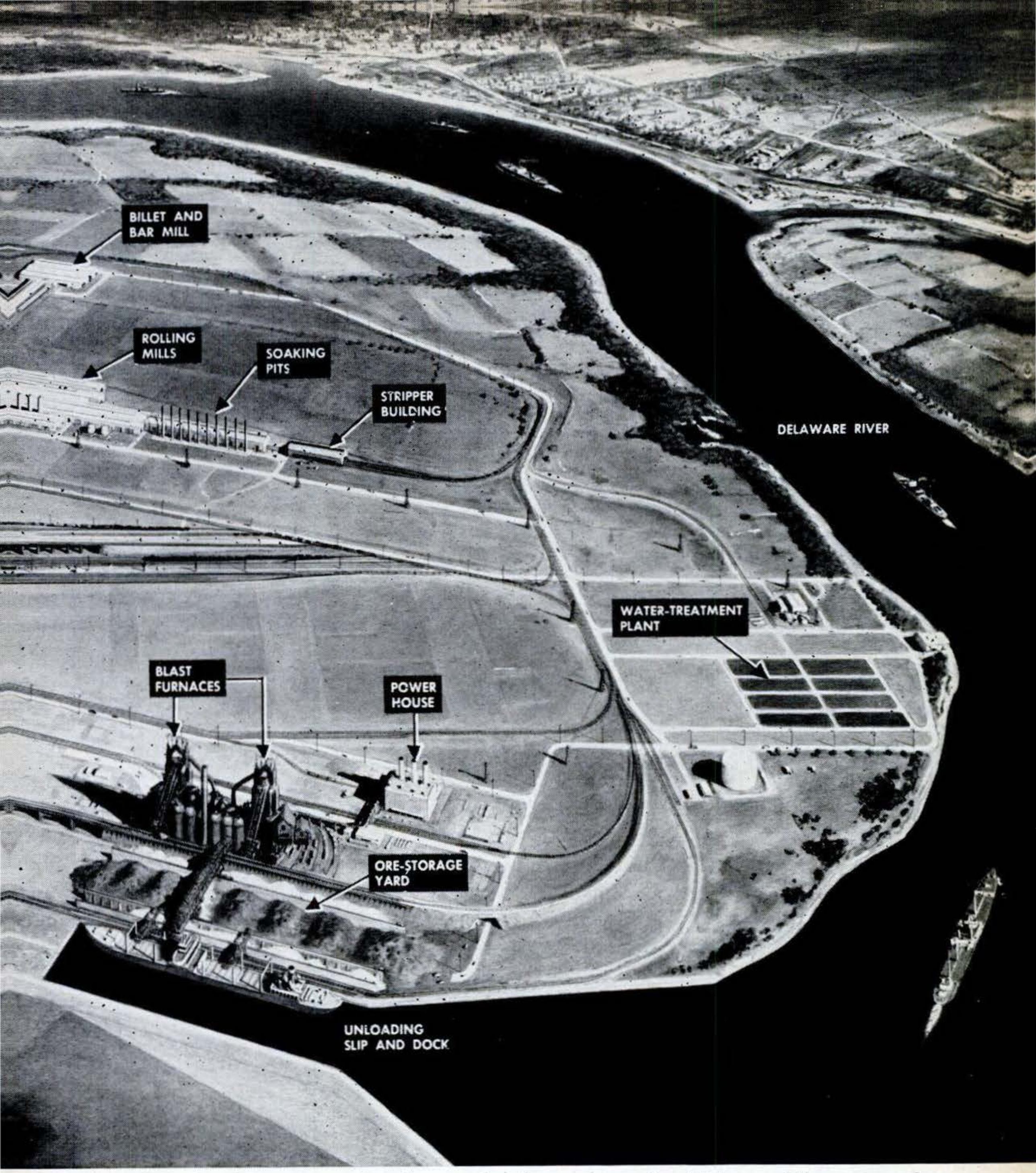
Artist's drawing shows how 3,800-acre Fairless Works of U. S. Steel, near Morrisville,

will be capable of producing 3,000 tons of pig iron a day. They will feed the plant's nine big open-hearth furnaces with enough iron to turn out 1,800,000 tons of steel ingots a year. That's enough steel to build annually a *total* of:

- 10 aircraft carriers,
- 2 heavy cruisers,
- 500 airplanes,
- 500 army tanks,
- 500,000 three-inch shells,
- 10,000 freight cars,
- 300,000 automobiles,
- 574,000 household refrigerators!

Once the plant swings into full operation, the steel will flow in production-line fashion from the ore-storage yard at one end to the freight yards at the other. The raw mate-

Copyrighted material



Pa., will look when construction is completed next year. It will be world's most modern.

rials—enough iron ore, limestone and coal every year to fill a train of railroad hopper cars 1,250 miles long—will arrive via the Delaware River.

The ore and limestone will be stockpiled in a giant ore yard. The coal will ride a mile-long conveyor to two batteries of coking ovens. Each battery will consist of 87 ovens, and the two batteries will produce 1,000,000 tons of coke a year. These ovens also will produce important tonnages of such coal chemicals as phenol, light oils, ammonium sulfate, crude naphthalene and tar, as well as coke-oven gas for use as fuel elsewhere in the mill.

The two blast furnaces will convert the iron ore, coke and limestone into a continuous flow of pig iron to feed the big mouths

Copyrighted material

of nine open-hearth furnaces which will turn the iron into various types of steel. Enough bricks to build 1,100 six-room homes are being used for this battery of furnaces, which will be the world's largest.

From the furnaces, the steel ingots, weighing five to 25 tons, will be moved by rail to the plant's longest building—it will stretch along for more than a mile. There, the ingots will be stripped from their molds, reheated in soaking pits, and then sent through rolling mills to be transformed into various types of steel stock. Each main electric driving motor on these mills will produce as much power as a locomotive hauling a streamlined train.

Steel Mills Are Thirsty

In full operation, the Fairless Works will require as much electric power as a city of 450,000, such as Newark, N. J., Kansas City, Mo., or Seattle, Wash. For fuel, in addition to coke-oven gas, it will use about 9,000,000,000 cubic feet of natural gas—enough to heat half the homes in Philadelphia—and approximately 42,000,000 gallons of fuel oil every year.

All steel plants are heavy water users—it takes about 150 tons of water to produce a ton of finished steel—and the Fairless Works will be no exception. About 230,000,000 gallons a day will circulate through the plant for cooling and cleaning. Some will be pumped in from the Delaware River and some will come from wells. More will be put back into the river than is removed, and it will be cleaner than the water drawn from the river.

Soot Will Be Trapped

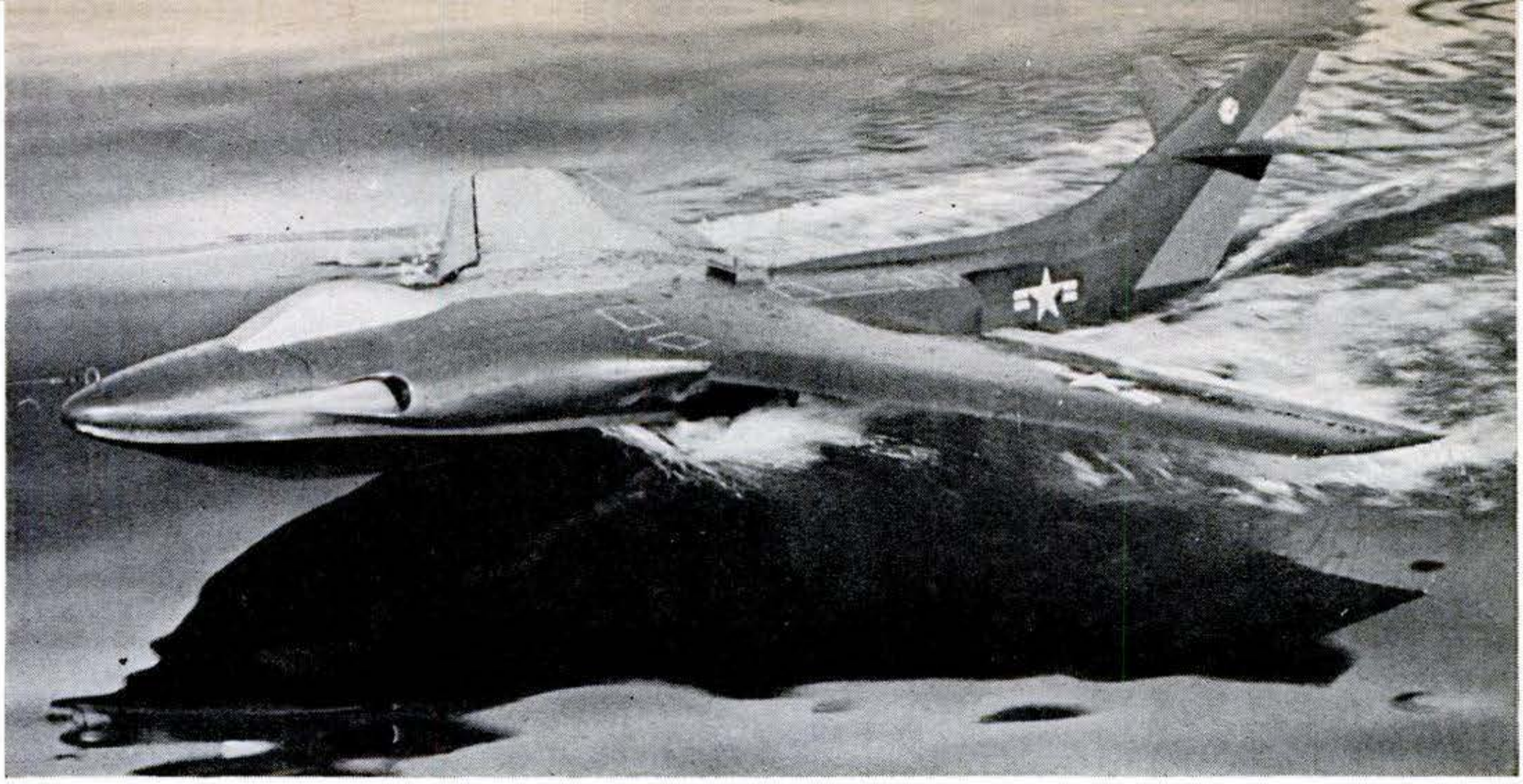
The bellowing clouds of black smoke and gritty soot that most people associate with a steel mill won't be visible at the Fairless Works. The blast furnaces will have dust catchers and electric precipitators to remove any fine ore particles that might otherwise escape. The trapped furnace gases then will be cleaned and used to heat the tall cylindrical furnace stoves that heat the air for the blast.

The coke ovens will be of a type that traps the smoke and gases generated during the coking process, and special equipment installed in the open-hearth shops will prevent dust from entering the furnace stacks. In addition, all locomotives used on the plant's 70-mile standard-gauge railroad will be Diesel-powered.

The Fairless Works is the largest single element in a defense program that eventually will add more than 4,000,000 tons a year to the capacity of U. S. Steel's facilities. It will be a major factor in the effort to boost the 1950 production figure of 97,000,000 tons of steel ingots to 118,000,000 tons by the end of 1952. That will be just about three and one-half times what Russia and her satellites were able to produce last year.

This steel-storage warehouse skeleton looks big, but is short compared to a mile-long extension that will house rolling mills and soaking pits to heat ingots.

Copyrighted material



When high-speed, jet-propelled seaplanes are built, they probably will look like this model.

Supersonic Seaplanes Are on the Way

IN A preview of seaplanes that may fly faster than the speed of sound, sleek little models, powered by four miniature jet engines, are taking off from the choppy waters off San Diego bay. Controlled by radio from the ground, they streak along at a scale speed of 632 m.p.h.

The first full-scale version of the Skate, so called because its shape resembles a fish of that name, probably will be a twin-jet, water-based Navy night fighter. Flight tests with models indicate that it will be able to take off in 15 seconds; fly about as fast as present jet interceptors; plane through seas with 12-foot waves; land in seas that would swamp today's seaplanes.

Flying boats have always suffered the speed disadvantage of a cumbersome hull that had to be deep, not only to buoy up the plane in the water, but to provide clearance for the propellers. Switching from props to jet propulsion, a young engineer with the Consolidated Vultee Aircraft Corp., Ernest G. Stout, set out to design a seaplane so aerodynamically clean that its speed in flight would be limited only by the power of its engines.

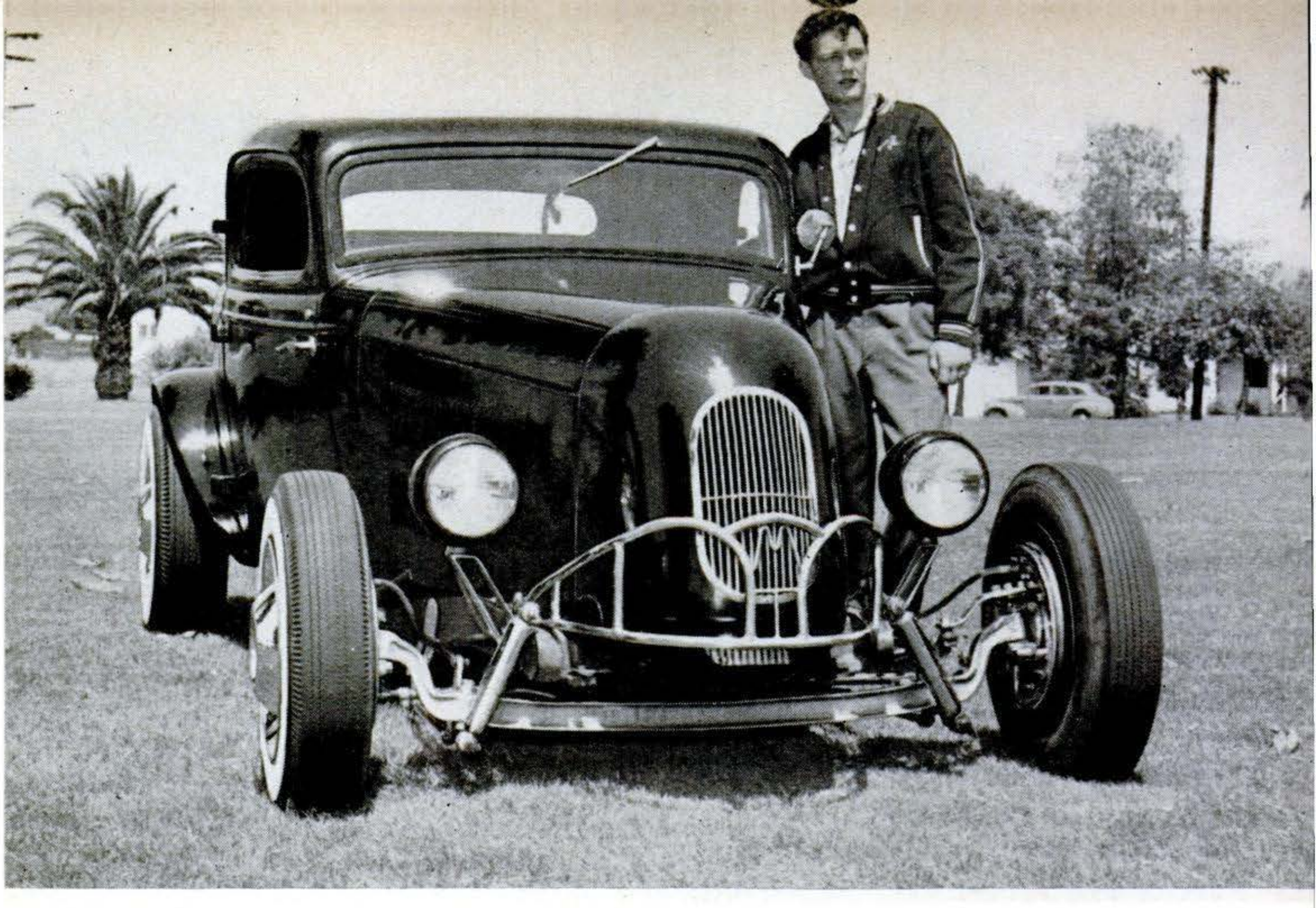
To achieve his goal, Stout devised the blended hull-wing—in effect, a flying hull. When the engines roar, all areas of his Skate, from tip to tip, from stem to stern, exert lift. The sweeping lines of his hull, however, didn't lend themselves to an easy breakaway from the water. So he put a 45-degree retractable step under the hull to lessen the drag of water on take-off.

Ernest Stout shows off blended hull-wing of 1/13-scale model of his Skate Seven. Full-size version will have 75-foot wingspan, be 62½ feet long, stand only nine feet high.

Another flying-boat problem he had to lick was spray. This he did by installing narrow metal strips sloping downward from the hull. Acting as dams, they deflect the spray down, robbing it of its bounce and force. The spray dams are also retractable.

Skate Seven, shown at the top of the page, isn't the final development. Versions eight and nine are flying secretly—and one may be a supersonic model. If not, Stout has plans for a delta-wing seaplane. END

Copyrighted material



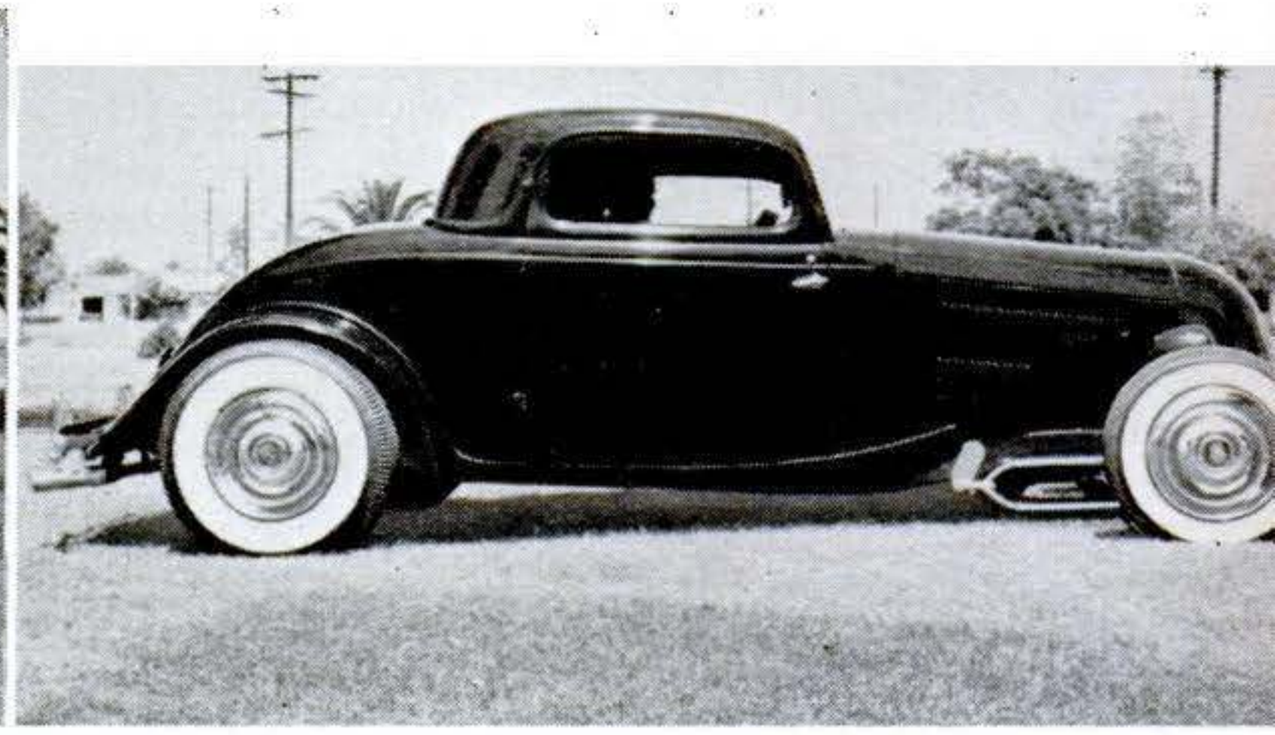
Father and Son Build Hot Rod

YOUNG Monte Trone, Long Beach, Calif., high-school student, wanted a fast coupe of his own—but bad. He decided to build it himself after school hours and with his dad's help. Three years later the job was done—a sporty hybrid that's clipped a neat 123 m.p.h. in supervised time trials on dry-lake speed courses.

A 1933 Ford chassis was the starting point. Monte installed a racing-car nose and hand-formed the rear fenders to their new contour, adding a ¼″ welding bead for reinforcement. Then he redesigned the hood panels and altered the cowl to fit. A lowered front axle makes the car slope down.

Supplying power is a souped-up 59A Mercury block. And as befits a proud craftsman, Monte put his signature on the job by welding monogram initials on the front nerfing bar.

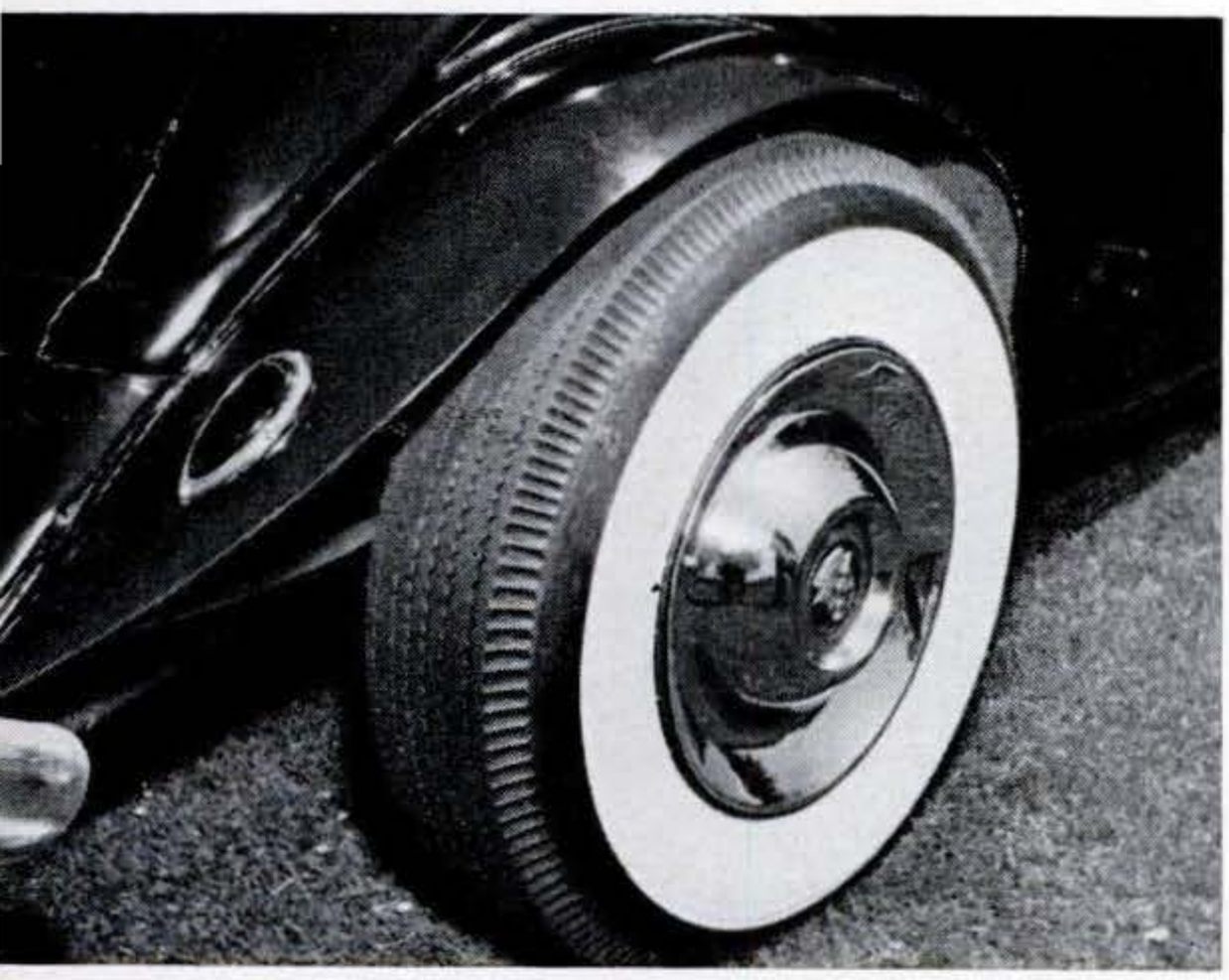
Tail plate of reworked Ford coupe shows Monte is a member of the Cavaliers, a Southern California group of car-building enthusiasts who also are leaders in a safe-driving campaign.



Chromed front axle was lowered three inches, producing a sleek, nose-down look. The top of the coupe barely reaches the young builder's shoulders. Car is finished in jet black.

Copyrighted material

Mercury block was rebored .060 inch, stroked ¼ inch, ported, relieved and electronically balanced. The battery box and headers were homemade. Engine has 265 cu.-in. displacement.



Rear fenders were partly cut away for appearance. Rear wheels were made by welding Ford center sections to Buick outer rims. Combination eliminates side roll, says Monte.

Dash panel and instruments came from a 1932 Packard Custom, one of only a dozen that were built. New gauge added in center is an r.p.m. counter for acceleration tests and time trials.

Mine Detector Spots Nails

THE worker above doesn't expect to find an explosive mine in the log he is checking. But the war-surplus detector will warn him of hidden nails and bits of metal that could wreck equipment in the sawmill of the Monon Lumber Co., New Albany, Ind. The metal can then be removed before it does any damage.

Jets Show Afterburners

STREAMS of fire against a dark sky spurt from the tails of Lockheed F-94s as they turn on their afterburners for an extra burst of speed and climbing power. Shown starting on a night training mission over the Pacific, the Air Force all-weather jets are the first planes to place afterburners in operational use.

Copyrighted material

Giant Doughnut Proposed as Space Station

A rocket scientist presents a design for a man-made, man-carrying satellite to circle the earth 1,075 miles up.

INWARD is "up" and outward is "down" in the extraordinary structure pictured here. Dwellers in it would walk on its outermost wall, their heads toward its hub.

The drawing gives a scientific preview of an inhabitable "space platform" floating in the sky at a 1,075-mile altitude and circling the earth as a satellite.

An "artificial moon" such as this could serve as a military base, observatory and rocket-ship refueling station. Its possibilities have been reported under study by the Department of Defense. What it may look like is now revealed by a former German V-2 rocket expert, Dr. Wernher von Braun, of the Ordnance Research and Development Sub-Office, Fort Bliss, Texas. In a book just published by the University of Illinois, *Space Medicine*, he presents his conception of a feasible design.

Will Make Own "Gravity"

His proposed space platform, of 200-foot diameter, resembles a giant doughnut. It rotates slowly on its axis. As if in a submarine, its crew live and work inside its air-conditioned and pressurized rim.

Gravity will be absent. But centrifugal force from the rim's rotation gives occupants a foothold and enables them to walk along the wall. This artificial gravity also averts possible ill effects of prolonged weightlessness upon the human system.

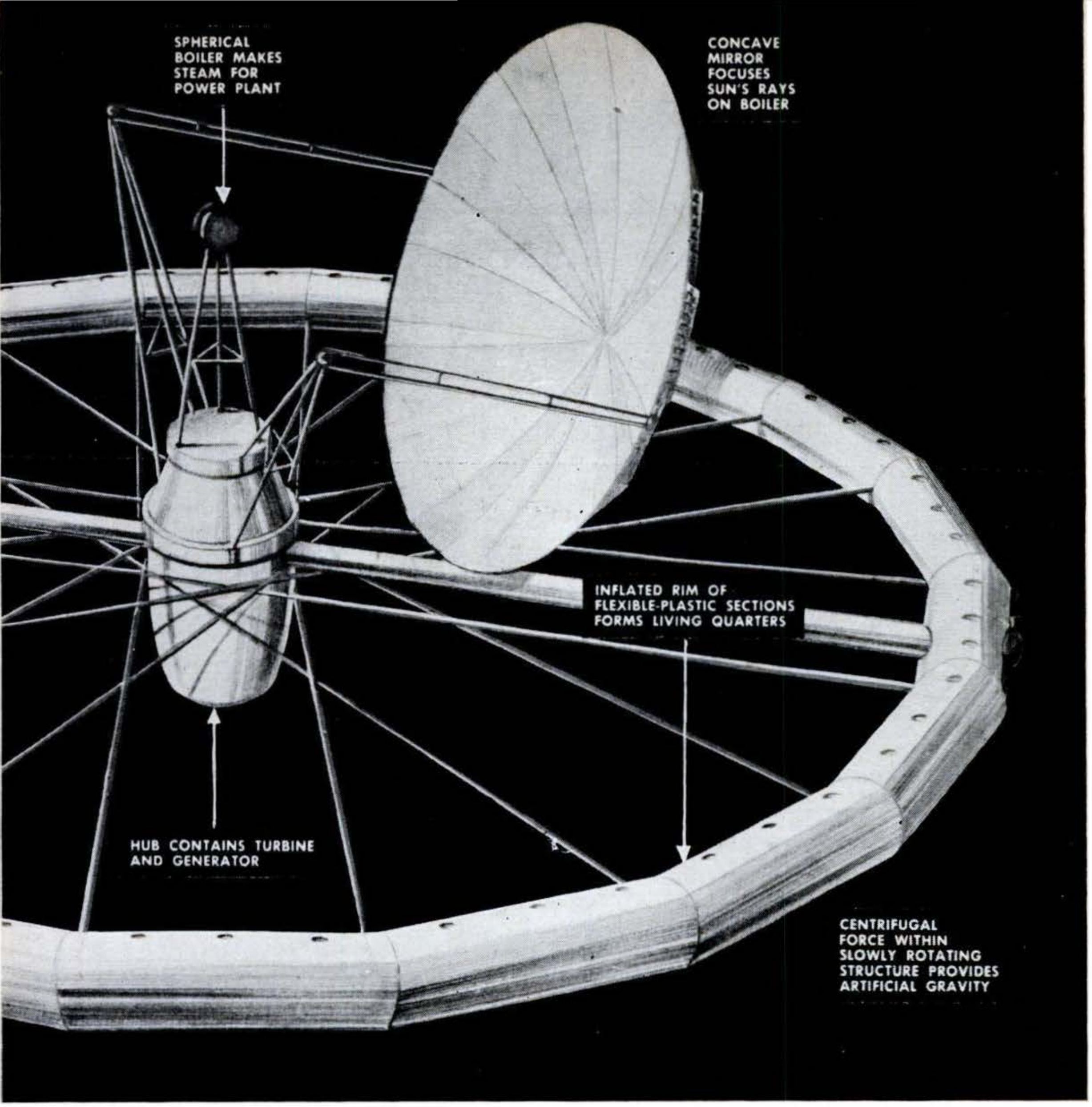
A silvery concave mirror focuses solar rays upon a boiler, making steam to run a turbine and generator for electric power.

By rocket ship, Dr. von Braun proposes, the platform's parts will be carried to its orbit for assembly there. Ten to 20 collapsible sections of flexible plastic, which can be unloaded through small hatches, will form the bulky rim. Men in pressurized space suits will join them and inflate the ring like a tire. Unloaded at an orbital speed offsetting the earth's pull, men and materials will float in space, as will the assembled platform.

But its inhabitants will not be marooned there. Rocket-ship "ferries" plying between the earth and its new satellite will pick up returning personnel and deliver relief crews, provisions and rocket fuel.

Feasibility of the whole idea, of course,

Copyrighted material



hangs upon developing rocket ships that can erect and serve the space station. Such a ship, Dr. von Braun has calculated, will be a triple-stage rocket of 30-ton payload, about 200 feet long and 65 feet in maximum diameter. In flight it will launch a second, smaller rocket and this one will in turn launch the third and final rocket carrying passengers and cargo. The third-stage rocket will be winged for a gliding landing on its return to earth.

Satellite Could Drop Bombs

Incentives to erect a space platform are urgent, Dr. von Braun points out. An observatory free of atmospheric disturbances, it could have telescopes powerful enough to see people on earth. It would offer weather forecasters and astronomers an ideal view of the earth's cloud formations and the stars. As a way station, it would speed the day of interplanetary travel.

More immediately vital, it would make a non-interceptible bomb carrier, swooping around the earth in two hours at a height beyond reach of present defense weapons. It could launch rocket missiles and guide them accurately by remote control and radar to any spot on earth.

"It appears to me," Dr. von Braun declares, "that in the atomic age the nation which first owns such a bomb-dropping space station might be in a position virtually to control the earth." END

Copyrighted material

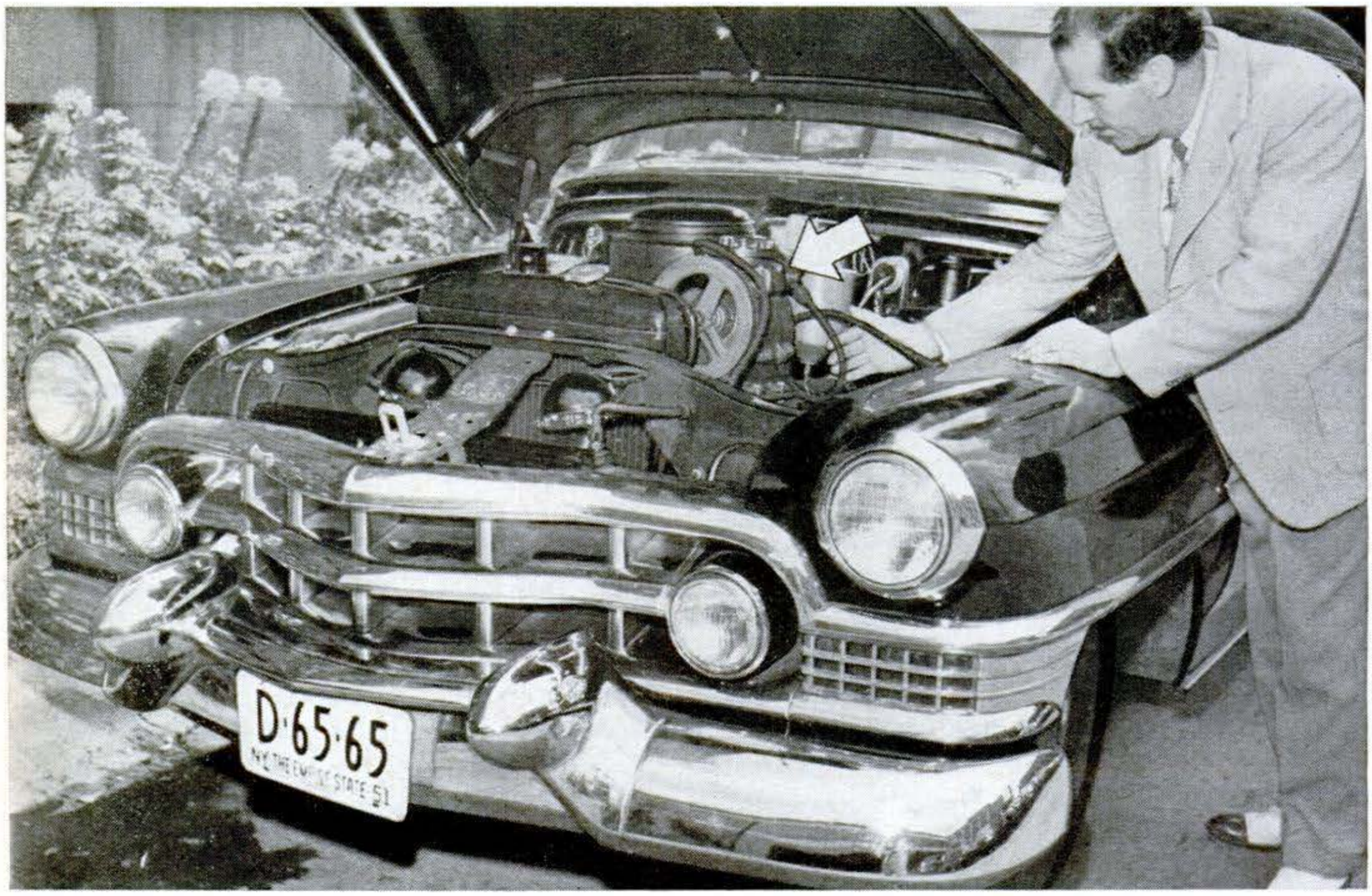
New British Rifle Outfires U.S. Garand

THE place: Westminster, England. The contestants: A new British .280-cal. automatic rifle vs. the U. S. automatic Garand M-1. The score: 84 rounds of fire a minute to 43—in favor of the British .280.

A radical departure in design, the new British weapon, developed by the Army after five years of research, has no wooden stock, is almost a foot shorter and more than a pound lighter than the Garand, and carries 20 rounds of ammunition instead of eight. It has an optical sight in place of the Garand's traditional peep type. While the gun's penetration is slightly less than the heavier Garand, it has only half the kick.

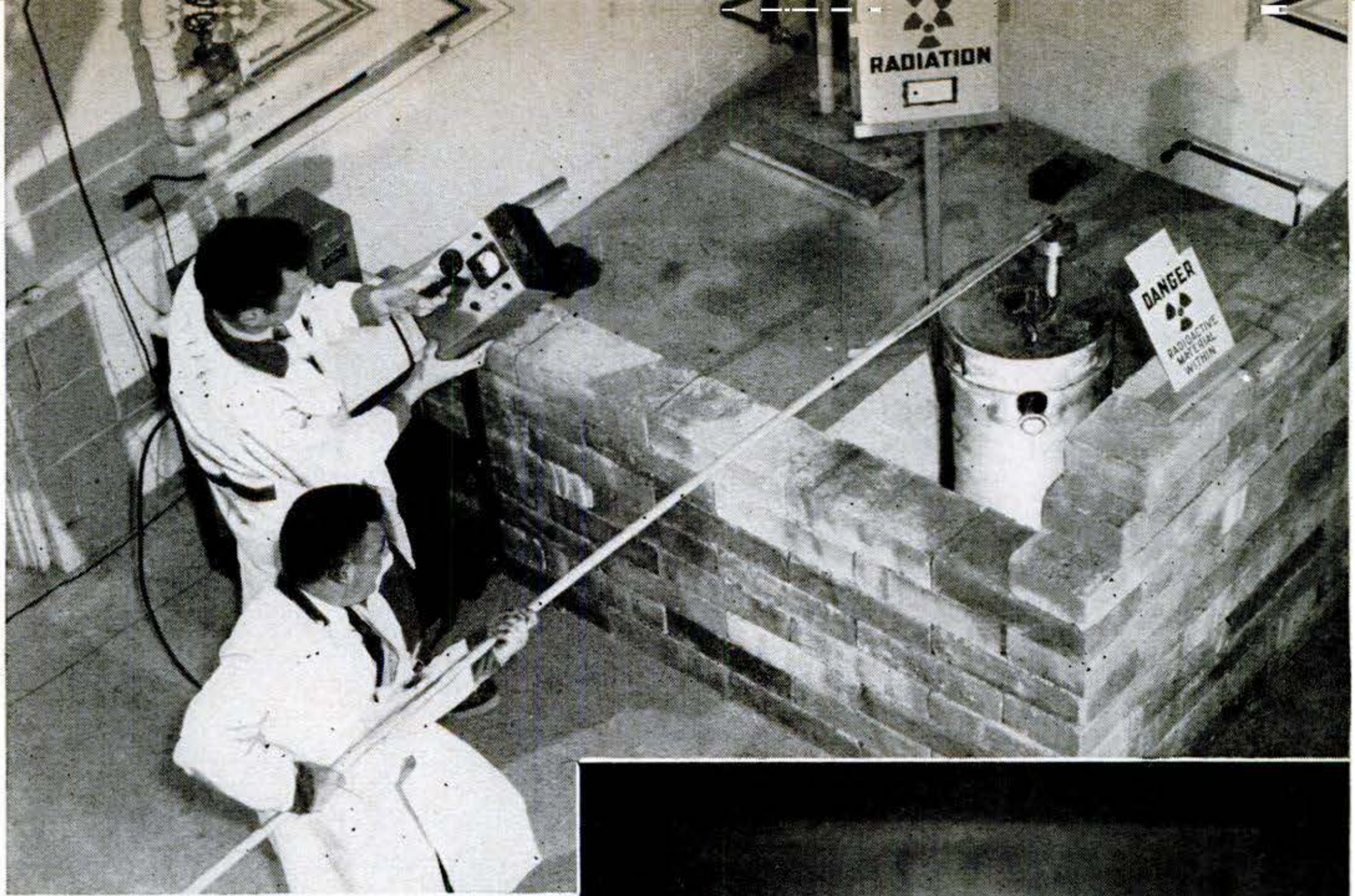
Although the British call it "the best weapon of its kind in existence" and plan to adopt it as the standard infantry arm, the U. S. is not likely to switch rifles.

Luxury Car for Argentina's President Is Air-Conditioned



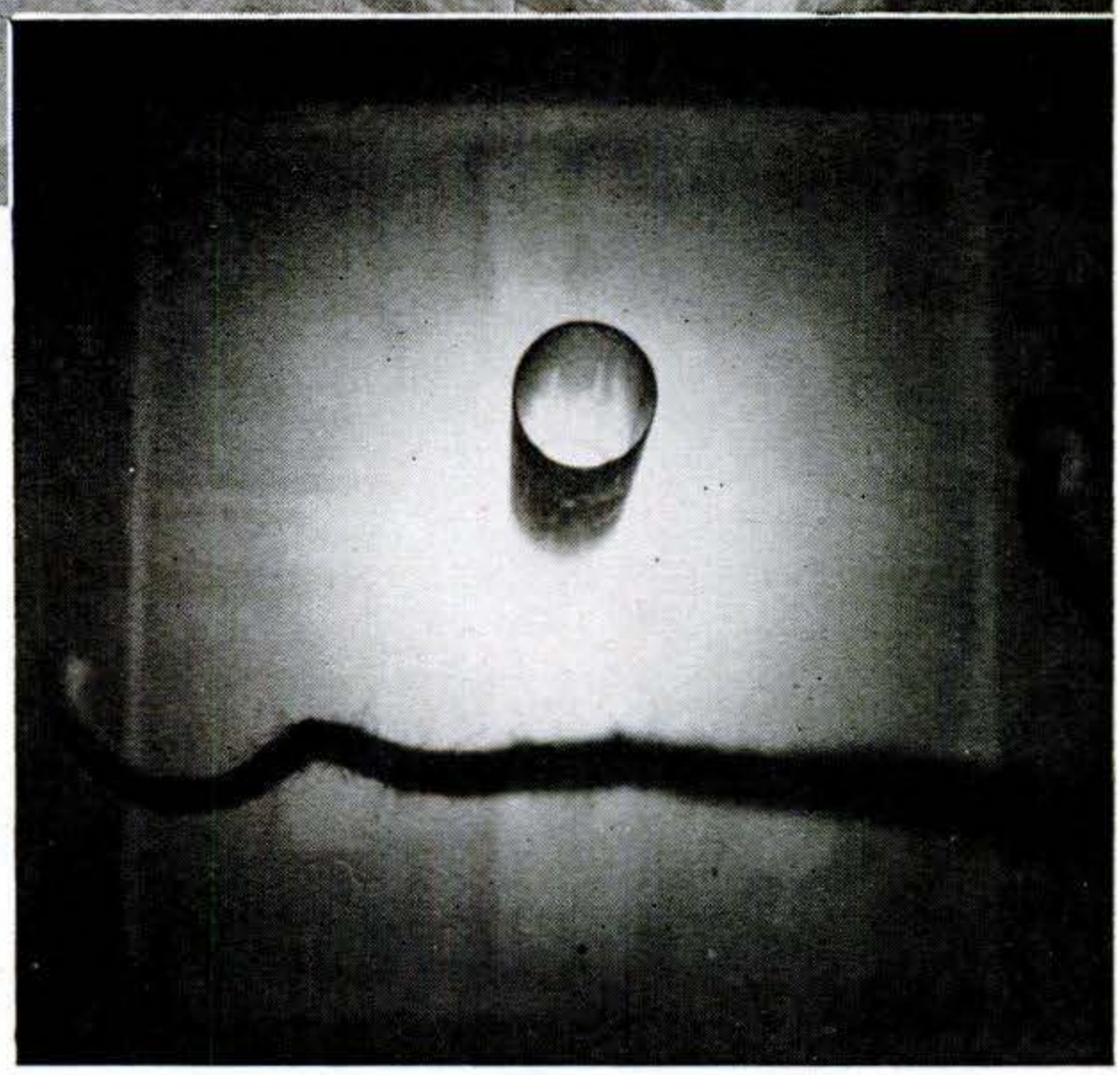
A REFRIGERATOR unit (arrow), powered off the fan belt, will lower the temperature 15 degrees inside a de luxe, $11,000-Cadillac fancied up for Argentina's President Peron and his wife, Eva. The unit also will ice a built-in bar. Among other gimmicks are: back-seat television, telephones, folding tables and bulletproof glass.

Copyrighted material



Radium Substitutes Equal World's Supply

ATOMIC-RESEARCH technicians above are uncorking one of two tiny bundles of radioactive energy that will each emit as much gamma radiation as all the radium that existed before World War II. Made of the rare isotopes cobalt 60 and tantalum 182, the new highly powerful radiation sources will make many industrial experiments possible for the first time. Prepared at Brookhaven, they will irradiate test samples submitted by industry, then the samples will be returned for study. They are expected to find early use in research on food preservation and plastics.



Radioactive tantalum under several feet of water in the reactor "canal" emits enough light to take its own picture. Pipe and rope are used to handle isotope.

Rim Saw Rips Big Timber

THIS circular saw blade has no middle—just a toothed rim. A 30-inch band of steel rotating in a light aluminum frame, it will cut through trees up to 30 inches thick without any central shaft to get in the way or add weight. Driven at the edge by a flexible shaft from a small gasoline engine, it can be held at any angle, even laid flat on the ground for cutting down trees without leaving stumps. The blade rides on three ball-bearing rollers in the frame, and a hook holds it firmly against a log while cutting. The Barker Saw Co., of Springfield, Mo., makes the outfit.

Copyrighted material

Pillow balloons are being tested for leaks. "Svoboda" is "freedom" in Czech and Russian.

'Freedom' Leaps Iron Curtain

Another type of freedom balloon starts its eastward journey from Munich. Made of rubber, the 24-inch sphere will rise to 25,000 feet, when it will burst and rain its messages.

AN AMERICAN assembly line is turning out "freedom balloons" that are then stuffed with pro-democratic messages and released in West Germany to float with the prevailing winds over the satellite countries behind the Iron Curtain.

The pillow balloons shown above—accused of being the original flying saucers—were developed by General Mills at Minneapolis for upper-air research. Made of .0015-inch polyethylene, they are 54 inches square, and differ from ordinary balloons in that they do not stretch. Thus, with rate of escaping gas known, specific targets can be hit with a high degree of accuracy, making them ideal for the Crusade for Freedom.

Besides being able to carry a quarter of a pound of printed messages inside, their 2,916-square-inch surface makes a good "billboard" for freedom slogans. They also create good will among housewives, who eagerly grab the balloons and use the plastic for wrapping food or as tablecloths.

Copyrighted material

Wilbur Shaw Reports on

GM's New Engine

It looks like good news for motorists—this experimental 12-to-1 power plant. . . . Plenty of hustle plus more mileage.

By Wilbur Shaw

AT THE General Motors Proving Ground in Milford, Mich., I bent over a black box on the front seat of an automobile. It had two dials on it. Twin needles on one of the dials gave a composite reading of 2,328. Similar twin needles on the other dial gave a reading of 1.58.

The first figure stood for revolutions on a counting wheel attached to the back bumper of the car, the other one for time calibrated in minutes and hundredths.

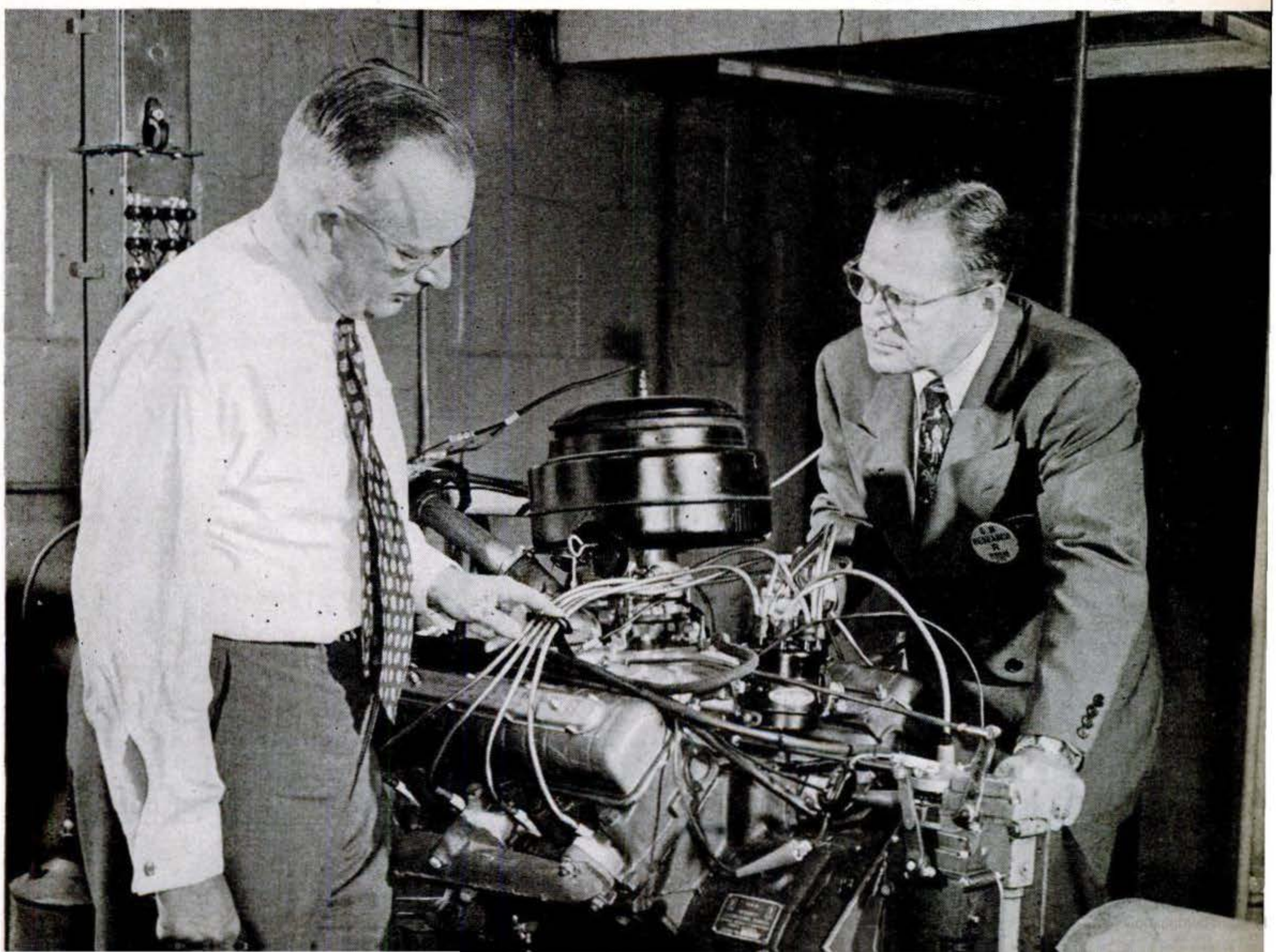
"There's your answer," commented an engineer beside me.

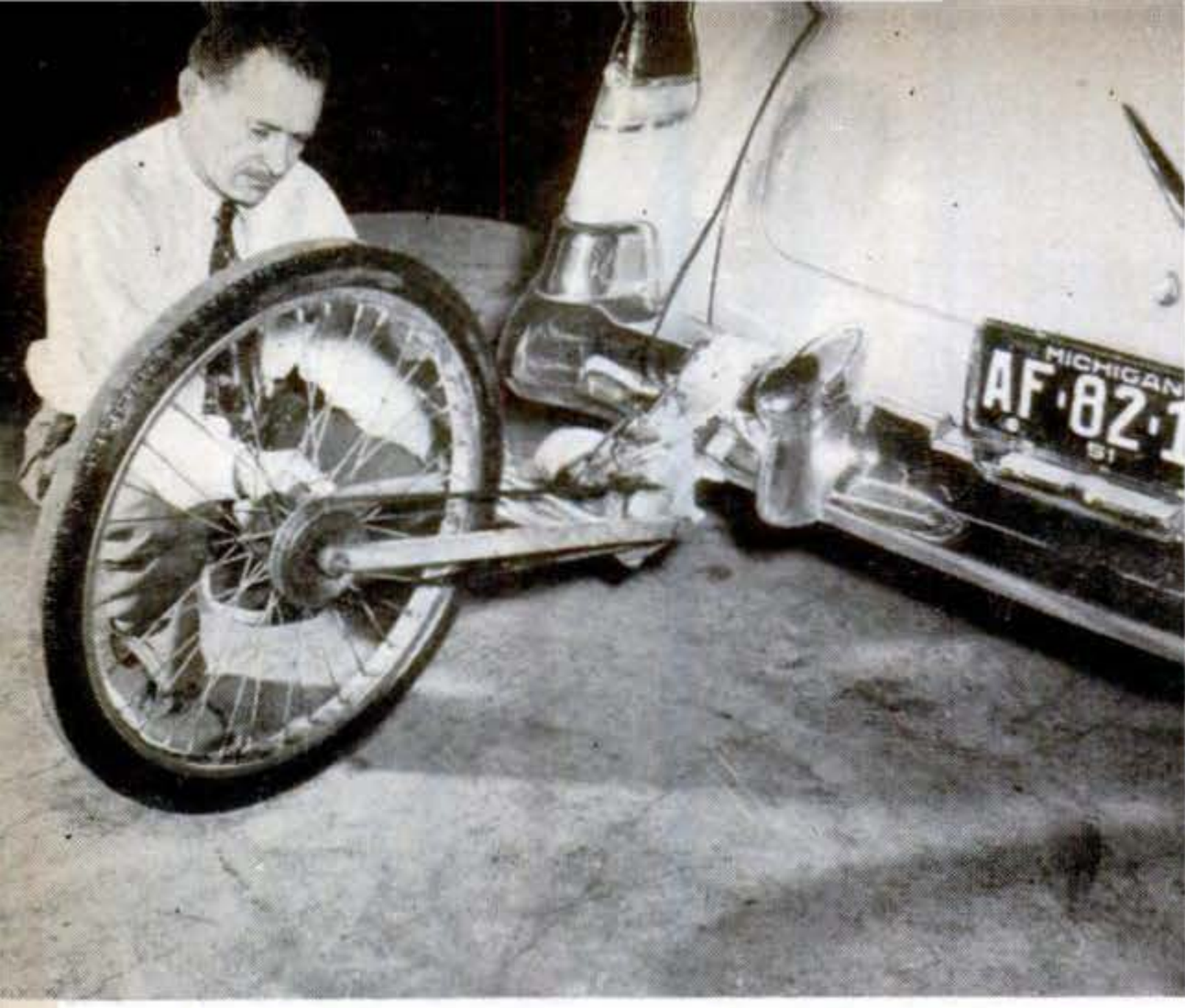
Without interpretation, the readings on the two dials were only a couple of figures in a mountainous mass of research statistics compiled daily at the proving ground. To the engineers tracking down the inside dope on a new high-compression engine, they were highly significant.

They meant that this experimental engine, with a shortened stroke, a special head and super-octane fuel, could drive a car as big as a Cadillac almost 30 miles at city traffic speeds—on one gallon of gasoline.

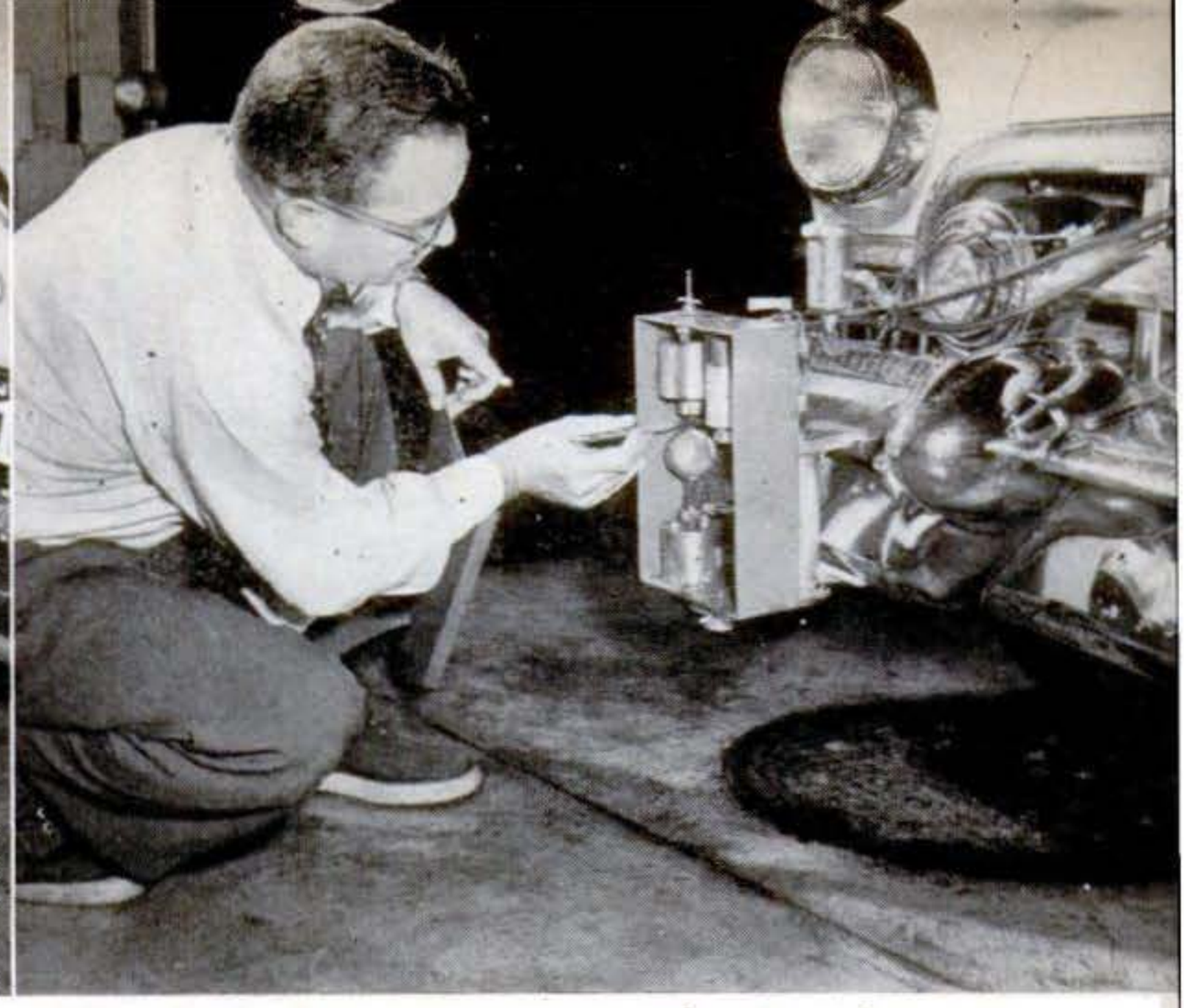
If engines with 12-to-1 compressions, like this one, eventually come into general use, motorists will get at least a third more gas

In Detroit, C. L. McCuen, GM's research chief, showed me the new high-compression engine.





The fifth wheel is a standard device for measuring distances traveled on a test track. Fuel burned in the 12-1 car costs GM 35 cents a gallon in bulk, would cost you and me a lot more.



This little box contains exactly 74 cubic centimeters of fuel for a test run. Electrodes cut off the main gas supply to the engine and reopen it when the run has been made.

mileage out of their cars even at 70 miles an hour on the open highway.

They will get the same scat they obtain from today's engines out of smaller engines tomorrow. And smaller engines would mean lighter-weight cars.

That was the reason I went to the proving ground—to get a first-hand feel of a development that promises so much for the future. I came away with some news not only about engine research but also about a new experimental Hydra-Matic transmission.

Before going to the proving ground I visited the Research Laboratories Division of General Motors in Detroit. Here they had another of the high-compression engines on test. I sat in a remoted control room and manipulated the throttle and spark on this engine. All about me were instruments that told how the engine's power output varied with throttle setting and how it reacted to fuels of different octane (anti-knock) ratings.

I manipulated the controls on the high-compression engine being block-tested in the laboratory. The scale you see in the right background registers amount of torque developed.

Testing is the part of the research process that takes the time. Designers immerse themselves in higher mathematics to project the specifications on a new engine. They build it. They plot its probable performance. Then they spend thousands of hours testing it under controlled conditions to see how close they came.

Putting an Engine on the Spot

The proving ground is something else again. Here engines on test are put into automobiles and road-tested under any and all conditions of temperature and humidity. This simulates the kind of treatment that the engines would get if put in the hands of hundreds of thousands of motorists.

The particular engine I came to see was dubbed the "19XX." The "19" stood for the century, the "XX" for a question mark as to the year it would—if ever—reach the salesrooms on America's Automobile Rows.

There were instruments at the proving ground too, but they were portable. They were mounted on or carried in the car equipped with the test engine. The black box that I've mentioned depended on two separate instruments to deliver its readings.

One was the fifth wheel. This is a wire-spoked bicycle-type wheel with a generator attached to it. As the wheel revolves through its free contact with the roadway, it generates electricity. The current is fed by a wire temporarily routed through a rear window of the car to the box on the front seat.

Copyrighted material

A wheel-revolution counter and a clock, shown here, are indispensable in figuring a car's actual speed. The availability of high-octane fuels is something yet to be determined.

The other instrument you see here, in the hands of the GM engineer who rode with me, tells how far the spark can be advanced on fuels of various octane ratings without getting a knock.

There a galvanometer, an instrument for measuring voltage, calibrates the strength of the current in terms of wheel revolutions.

The fifth wheel supplies one of the pieces of information needed to determine fuel consumption—exactly how far the car travels.

A second item of information needed is how long it takes the car to travel a certain distance. That's supplied by a clock. If the engineers know the distance traveled and the time it took, they know the miles-per-hour. The miles-per-hour figure is important because gasoline consumption changes with speed.

Still missing, of course, is a third piece of intelligence—how much fuel was used to drive the car a given distance at a given speed. That's supplied by a box clamped to the front bumper of the car. In the box is a chemist's burette, a vial, containing exactly 74 cubic centimeters of fuel. A fuel line to the engine is attached to the top of the burette.

Running Out of Gas on Purpose

When a test run is made, water treated with copper sulfate is cut into the car's fuel supply line below the burette. The copper sulfate boosts the water's electrical conductivity. When the water reaches an electrode on the bottom of the burette, it sends an impulse to the black box. This starts the recording mileage meter and the clock. As the fuel flows from the top of the burette and into the engine, the water takes its place. When the water reaches an electrode in the top of the burette, it stops both the instruments. The fuel in the burette has been used up and the engineers start their calculations.

And here are the formulas used by the engineers to get their fuel consumption and the speed of the car:

The miles-per-gallon equals the figure .0116 multiplied by the figure on the revolution counter—2,328.

The miles-per-hour equals the figure .0272 multiplied by the figure on the revolution counter divided by the time consumed.

High Compression Lowers Costs

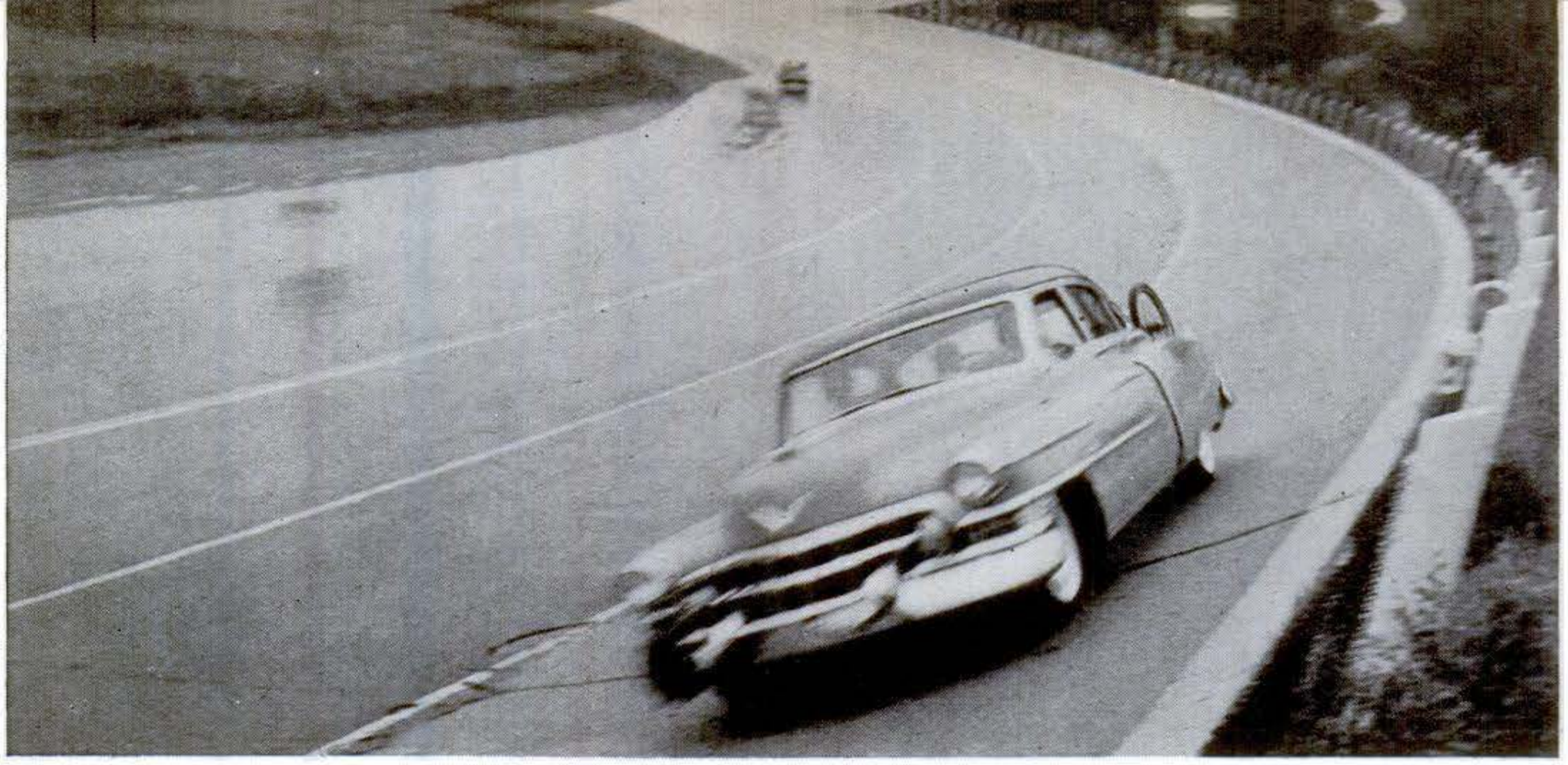
When, as I bent over the black box, the engineer beside me remarked, "There's your answer," he meant the new engine had done better than 27 miles to the gallon going 40 miles an hour.

Up to now, the best performance recorded by the engine is on 100-octane fuel treated with .4 cubic centimeter of tetraethyl lead—the same "booster" compound you get in your own gas. The fuel thus treated goes off the standard octane chart, which stops at 100 octane. GM has no doubt that presently it will be operating the engine satisfactorily on fuel of less than 100 octane.

I drove one of the 12-to-1 engines in a research car on the "Loop" at Milford. The Loop is a research version of a race track. The car, in all but engine and a change in the rear-axle ratio, was a Cadillac.

The new engine has a bore of 3¾ inches and a stroke of 3¼. That compares with 3 13/16 and 3⅝ inches respectively for the Cadillac's. The block is an Olds, specially bored. Piston displacement is 287 cubic

Copyrighted material



I drove the new engine at 70 m.p.h. on a wet track. It gets almost 20 m.p.g. at that speed.

inches compared with 331 for the Cadillac's, and the "19XX" develops 15 more horsepower than the maximum brake horsepower of the Caddy. The test car had a rear-axle ratio of 2.75 to 1. The Cadillac's is 3.36 to 1.

In almost every department the car matched the performance of the standard Cadillac. The engine carried me effortlessly into the higher speed ranges. High compression usually causes a little roughness, but I detected no roughness here.

More Mechanical Octanes

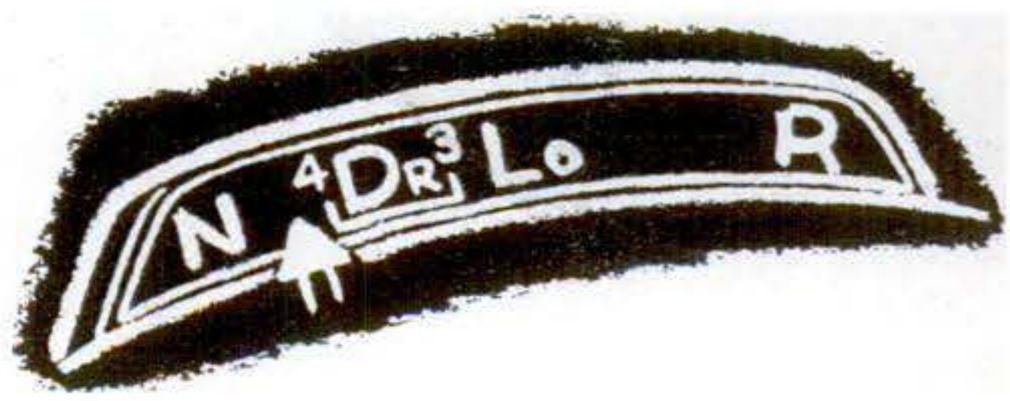
Performance matched that of the production engine with a compression ratio of 7.50 to 1. And that's exactly what GM was aiming at. All the added oomph of the 12-to-1 compression was being poured into fuel efficiency—more miles to the gallon. And they were getting the same acceleration and just a bit more top speed, plus better gas mileage, with a considerably smaller piston displacement.

The secret of the engine's performance was a union of "mechanical" and "chemical" octanes. Mechanical octanes, extracting more energy from a gallon of fuel, lie in engine design. An engine with a high mechanical octane rating "rejects" less heat. More of its heat goes into power and less is dissipated through radiator and exhaust.

To make use of its mechanical octanes, the engine had to be fed fuel containing more chemical octanes—gas that would burn better.

And now about that new Hydra-Matic transmission. As I rolled off the Loop and started up a hill on the proving ground, it proved itself. I left another Cadillac, equipped with the regular Hydra-Matic, as though it were standing still. When I slipped the selector lever into an extra notch on the quadrant, the car marched up the hill without that annoying shifting back and forth between gears in response to the torque demand.

In a word, the experimental transmission affords a motorist a dual range for performance. This is the way the selector quadrant on the steering post looked:



It gives you all the advantages of a quick-change rear end without your having to change the gears. For the conservative driver, it affords economy. For the hot-rodder, it offers top performance.

As I coasted into the garage area of the proving ground and switched off the ignition on the new engine, I glanced again at the black box with its two enigmatic dials. It was a sort of portent of the future. END

This Month's Shaw-ism

A safety hint: drive as though everyone else on the road was crazy.

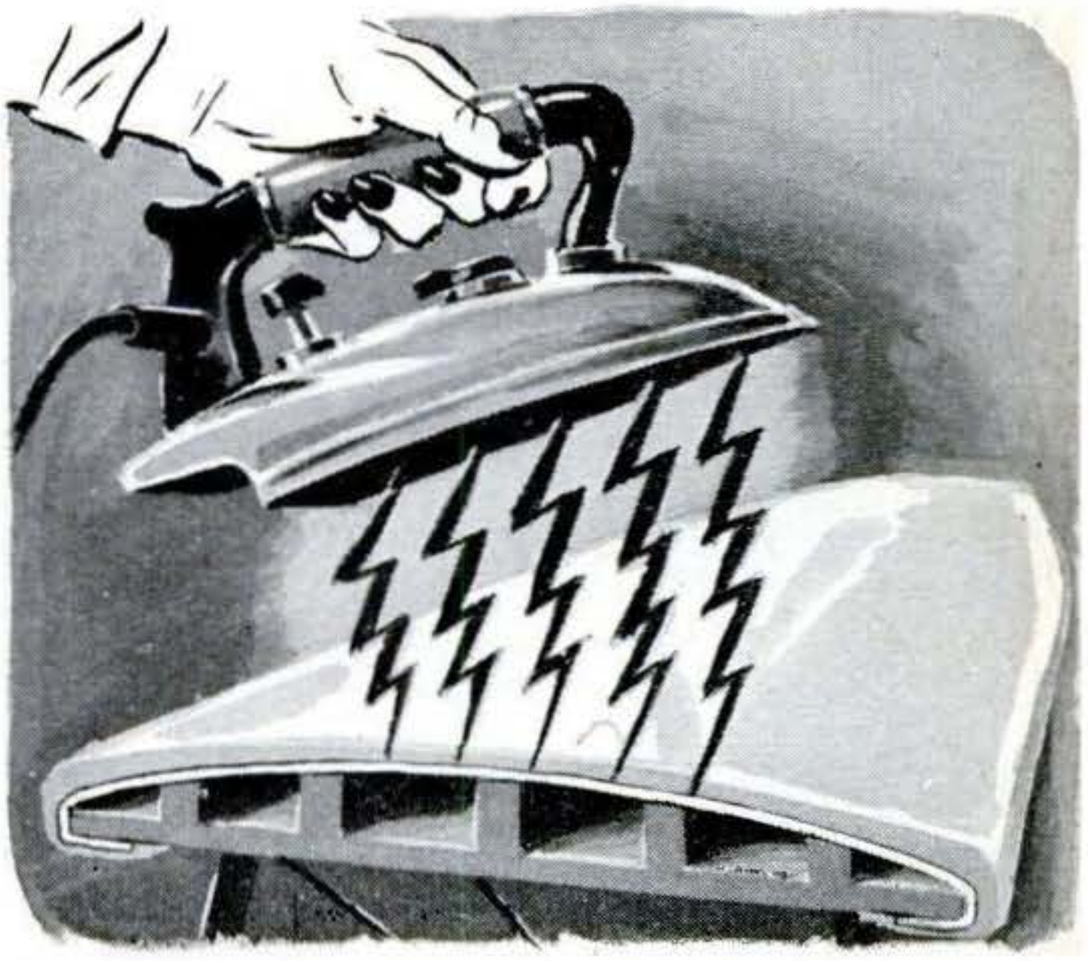
Kilton Shaw

Copyrighted material

New Ideas from the Inventors

1 Car Seat to Hide Washbasin. This idea would make it easy to wash up after changing a flat—it proposes a washbasin built right into the front seat. Pressing a button on the dashboard would trip a solenoid-operated catch, letting you raise the cushion next to the driver's seat to uncover the washbasin and spigot. Water would be piped to the basin from a tank located in back of the rear seat, as shown in inset.

2 Magnifier to Fit Sewing Machine. Getting the thread through the needle would be simpler with this magnifying lens. It would also give the sewing-machine operator a closer view of the working area. Fitted with a clamp, the attachment would mount on the stem of the machine's presser foot and could be adjusted to any angle.

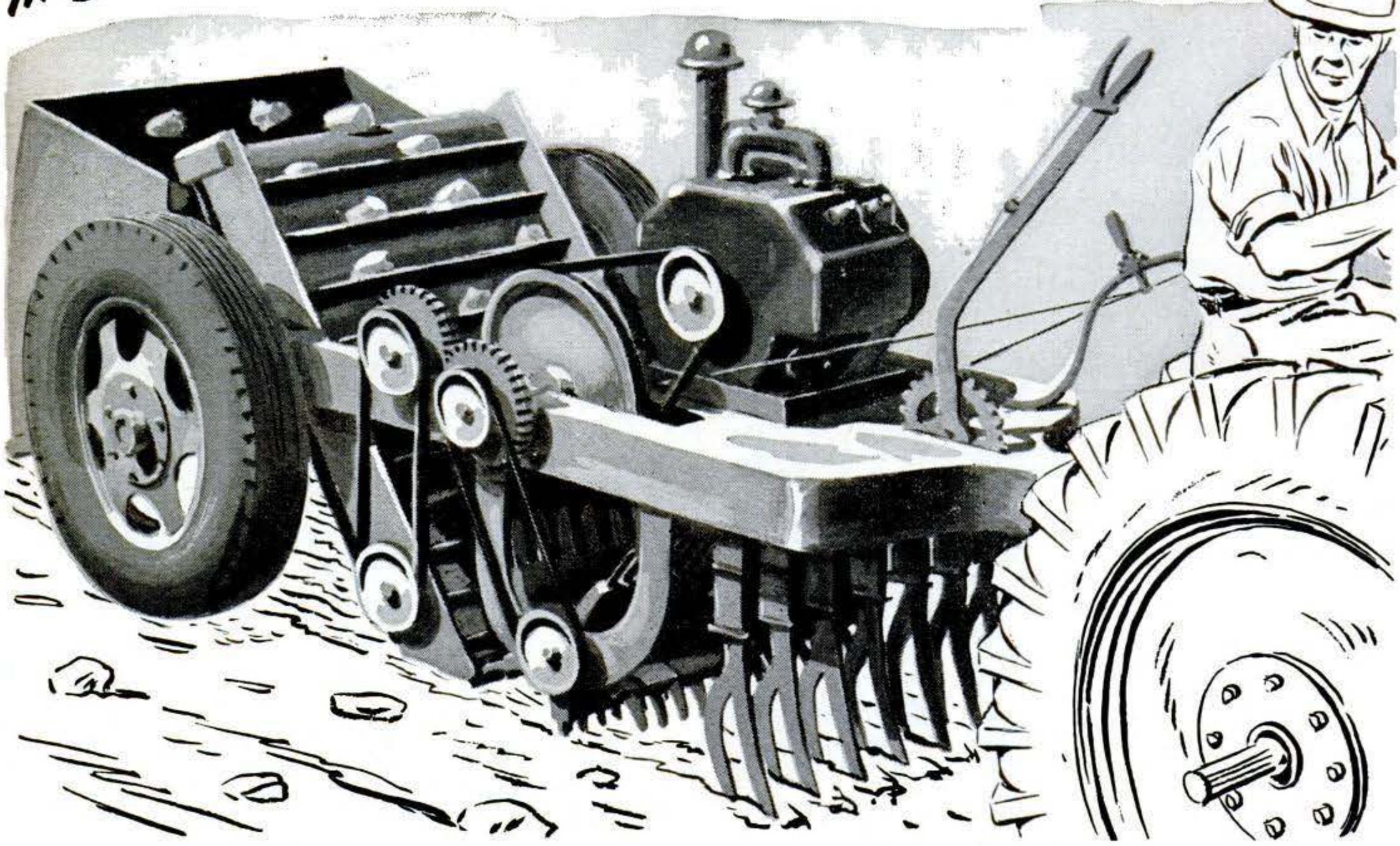


3 Magnetic Iron to Aid Presser. A person wouldn't have to work hard to remove wrinkles from clothes with this magnetic iron. Permanent magnets inside the appliance would hold it firmly down on an iron plate in the ironing board during pressing. To lift the iron, an extra control knob would raise the magnets to reduce their pull.

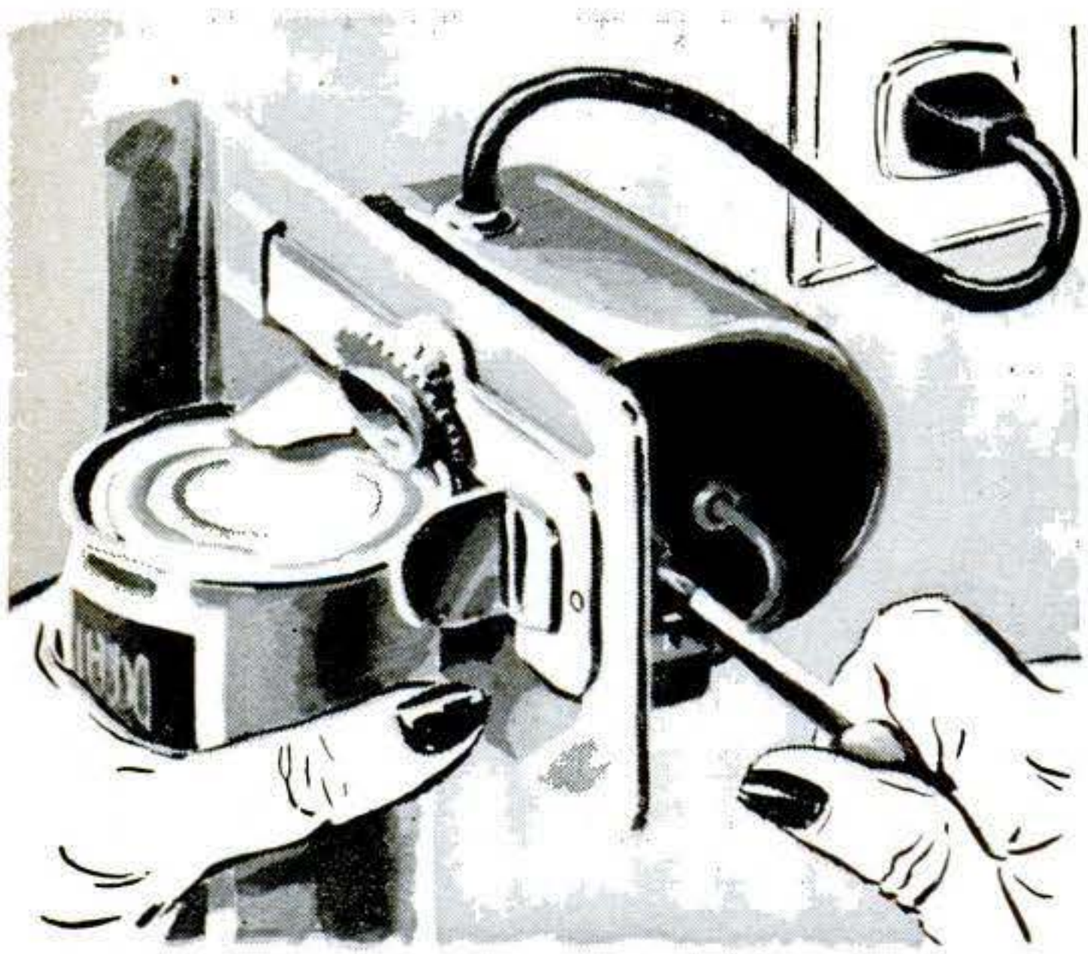
Please turn the page for three more new ideas.

Copyrighted material

MORE New Ideas from the Inventors



4 Machine to Pick Up Stones. Pulled by a tractor, this farm machine would dig stones out of the soil and then pick them up and haul them away. The stones would first be loosened by a row of curved teeth. Then a series of rotating claws would throw them onto a conveyor belt to carry them up to a hopper. A small gasoline engine would furnish the power to drive the claws and the conveyor belt.

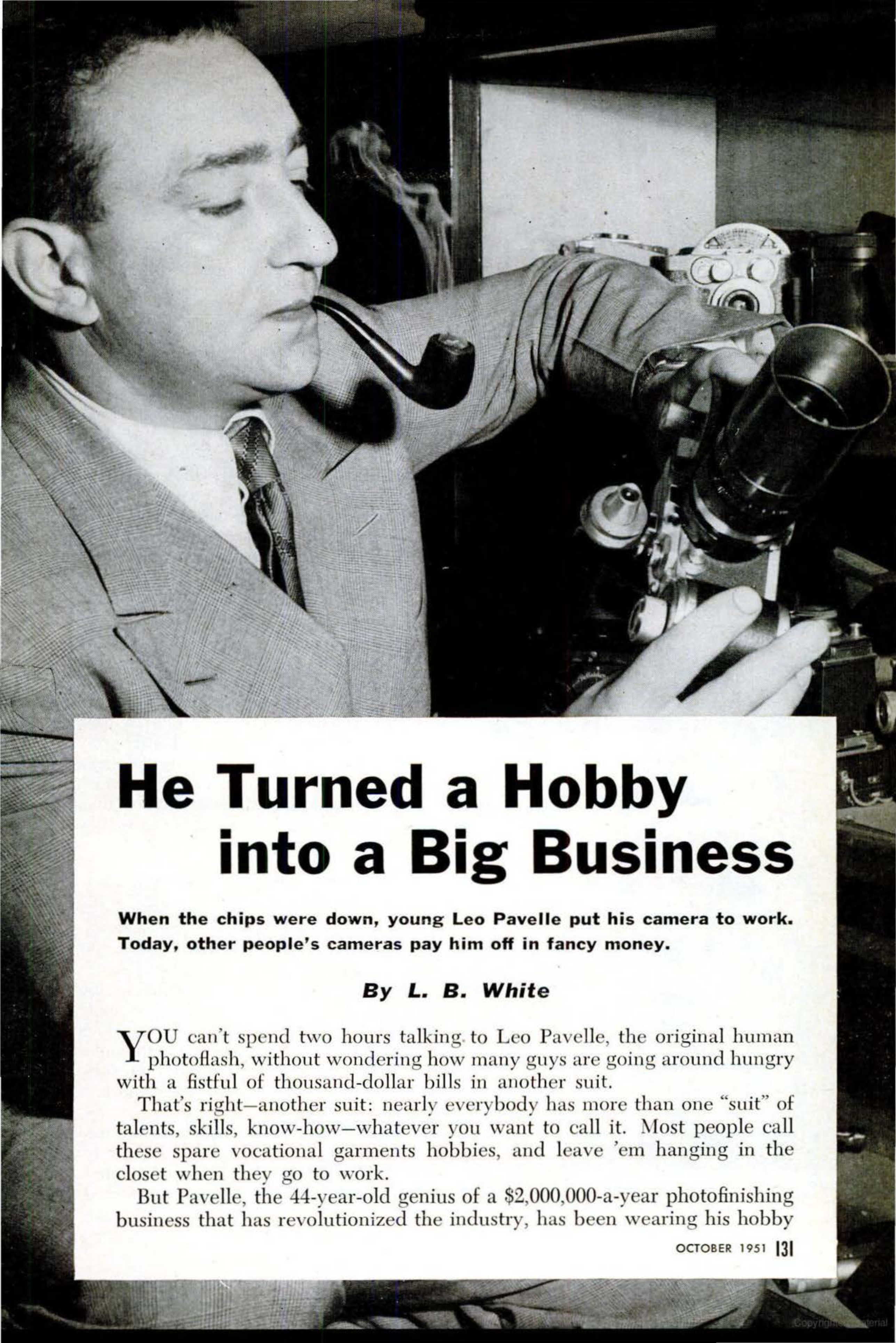


5 Motor to Turn Can Opener. An electric motor would do the work of opening cans in this invention. Pushing down a lever forces a rotary cutter into the top of the can and automatically switches on the motor. The motor rotates both the cutter and a feed gear that turns the can. Lifting the lever releases the can and shuts off the motor.

6 Dispenser to Light Cigarettes. This dispenser would not only hand you a cigarette but light it for you too. Push a lever and a cigarette drops into a spring-operated well. When the lever is released, the spring tips the well so the cigarette presses against an electric lighter. Lifting out the cigarette would shut off the lighter.

Patents on these inventions have been granted to: 1. P. Bailey, Oakland, Calif.; 2. K. Warner, Chicago; 3. C. Leonard, Cincinnati; 4. A. Cintula, Norwood, Mo.; 5. R. Raab, Rochester, N.Y.; 6. G. Thomas, Long Beach, Calif.

Copyrighted material



He Turned a Hobby into a Big Business

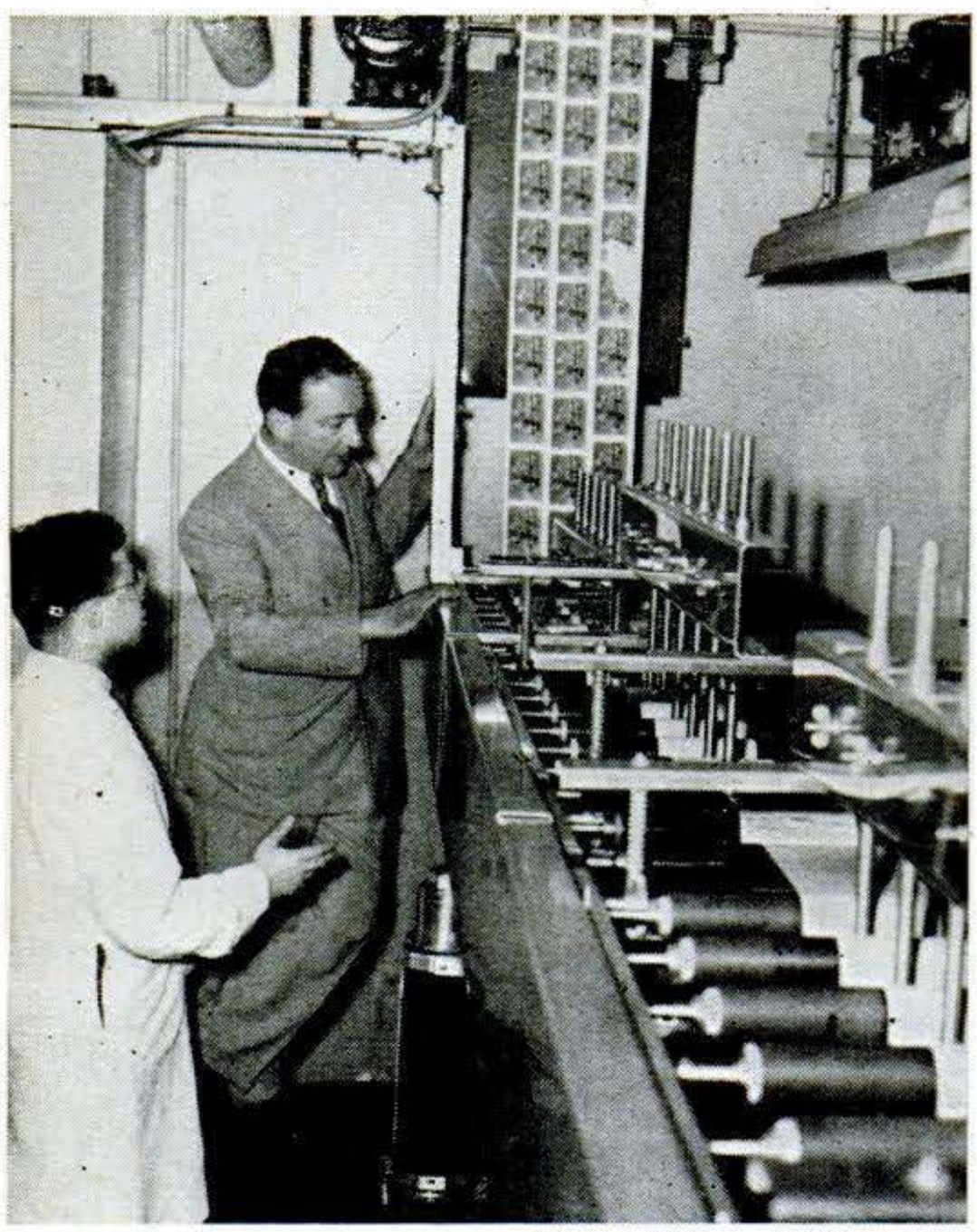
When the chips were down, young Leo Pavelle put his camera to work. Today, other people's cameras pay him off in fancy money.

By L. B. White

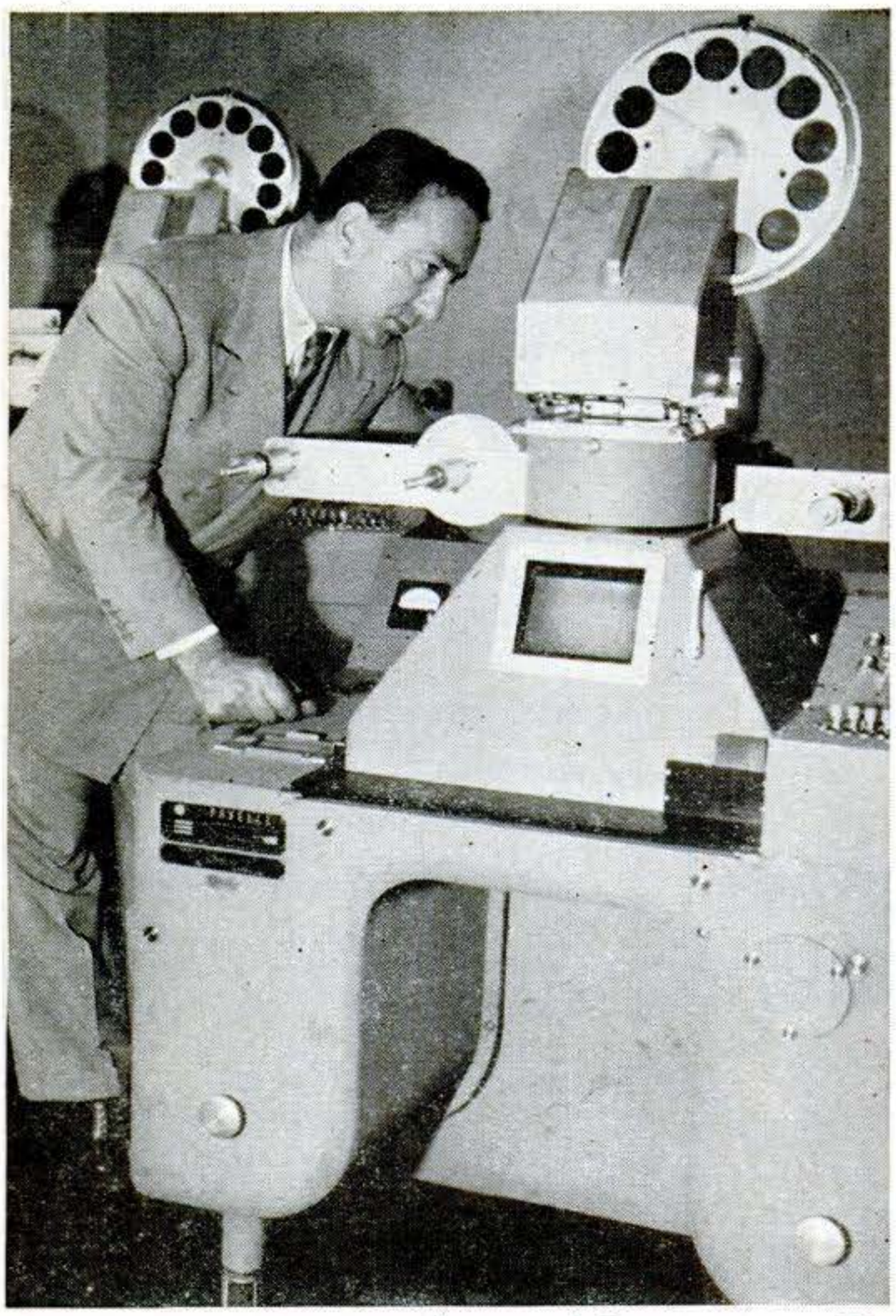
YOU can't spend two hours talking to Leo Pavelle, the original human photoflash, without wondering how many guys are going around hungry with a fistful of thousand-dollar bills in another suit.

That's right—another suit: nearly everybody has more than one "suit" of talents, skills, know-how—whatever you want to call it. Most people call these spare vocational garments hobbies, and leave 'em hanging in the closet when they go to work.

But Pavelle, the 44-year-old genius of a $2,000,000-a-year photofinishing business that has revolutionized the industry, has been wearing his hobby



Color processing of Printons is automatic in the machine above. Special air-conditioning system that keeps temperature at 72° allows a variance of only one-tenth of a degree.



Automatic enlarger, designed by Leo Pavelle for color work, has been converted to turn out black-and-white enlargements at the rate of 1,000 an hour. It will cut costs considerably.

to the office for 19 years—because the suit he originally ordered, mechanical engineering, came with empty pockets in 1932.

Maybe it would be more accurate to say of this Henry Ford of the hypo tanks that he wore a natty sports jacket over his cosmolene-stained overalls when he stepped out of college with a degree in mechanical engineering. Engineers then were a drug on the market. But he had a hobby and he combined it with his engineering knowledge. One result was a machine that turns out 1,000 enlargements an hour. Another result was a continuous roll printer that grinds out contact prints even faster.

Time for Other Hobbies

And, just in case this jalopy-to-Jaguar success story sounds like all work and no play, let it be noted that several times a year Leo Pavelle slips a hunting or fishing coat over his professional ensemble and whips off to Cape Cod for some surf-casting, or to the High Tetons for elk, deer and grizzly. And almost any evening you can find him in his home workshop in suburban Mount Vernon, hacking out stocks and grips for a gun-and-rod collection that some day may be worth. . .

But that's another hobby, another shrewd investment—and another story.

Leo Pavelle was born in 1907, in Dvinsk, in what between world wars was reborn Lithuania. His father brought him to New York in 1920—and he proceeded happily through high school and two years of college before the bottom dropped out of everything. The young engineering junior then had to think about how to earn the money to finish school.

On the Road to Photo Fame

Fortunately for him, he had one of the first German Leicas to reach this country. With it, he could do eye-catching work. At first, he made home portraits. Then he won a reputation on Broadway by photographing stage shows during rehearsals. The only hitch was that commercial photofinishers literally did not know what to do with miniatures: they groaned and threw up their hands whenever the midget film came into the shop.

But Leo turned this disappointment into an asset. He studied literature put out by the Leica people and the German photography magazines. If he could get a foot in the door of a finishing plant with adequate facilities, he felt certain he could utilize a

Copyrighted material

developing process by which silver nitrate is used to deposit a metallic silver layer on the latent image, thus achieving a much finer grain than was then obtainable.

At that particular juncture, he had the good fortune to meet his future wife, Carrie. Carrie's two brothers ran a photofinishing plant. Leo worked there summers during the years he was attending college, earning enough money to complete his education—and at the same time successfully trying out his theories of how to get good enlargements from Leica film.

Better Work Gets Business

Another thing he discovered that summer—one that was to stand him in good stead ever after—was the secret of how to get, and keep, business. He had had the discouraging experience of commercial finishers shrugging off poor prints as the photographer's fault. "You must have underexposed" and "You must have overexposed" were the clichés at camera shop and drugstore pickup counters. The theory seemed to be that amateur snapshooters ought to count themselves lucky if they could identify their subjects at all.

Pavelle, the ex-amateur, felt that anyone who cared enough to invest time, effort and film in his pictures deserved better of the darkroom boys. He experimented with ways to correct under- and overexposure. He scribbled friendly tips on slips of paper and stuck them in with his customers' prints. Soon, through the independent outlets he was building up, he was acquiring a reputation as "the fellow to send your film to." Camera clubs perked up their ears.

Leo Takes a Wife and Partner

In 1932, Leo and Carrie got married and went on their own. Business grew, slowly but steadily. It was hard work, because the Pavelles insisted on craftsmanlike results. Then, in 1933, Zeiss introduced the Contax to America. To Leo Pavelle, who at that time probably had more of a reputation in Germany than in this country, went a fat commission to do a raft of display pictures to advertise the advantages of the new midget for candid work. He spent a week at the famed Bronx Zoo, snapping animals in hundreds of natural split-second poses, and emerged with a hundred 16 by 20 prints that are still considered classics. Magazines then began to page Pavelle for tricky assignments.

[Continued on page 244]

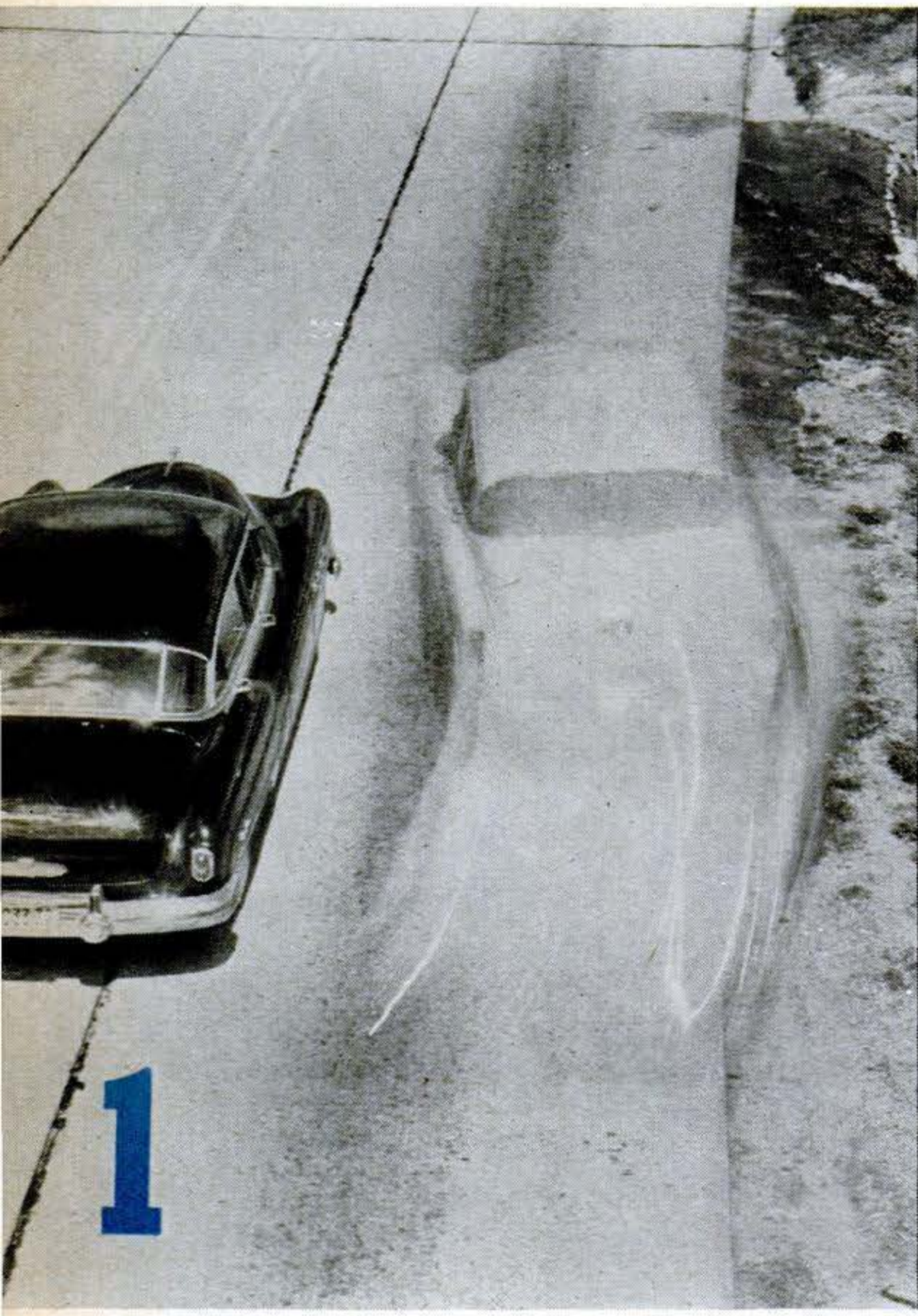
A hunting trophy is added to the growing collection in the Pavelle home in suburban Mount Vernon, N. Y. Here son Arthur helps his Nimrod father hang a prize head for just right effect.

Away from photo lab, hunting and fishing are the boss's favorite relaxations. In addition to an enviable rod-and-gun collection, he owns every type of camera on the market today.

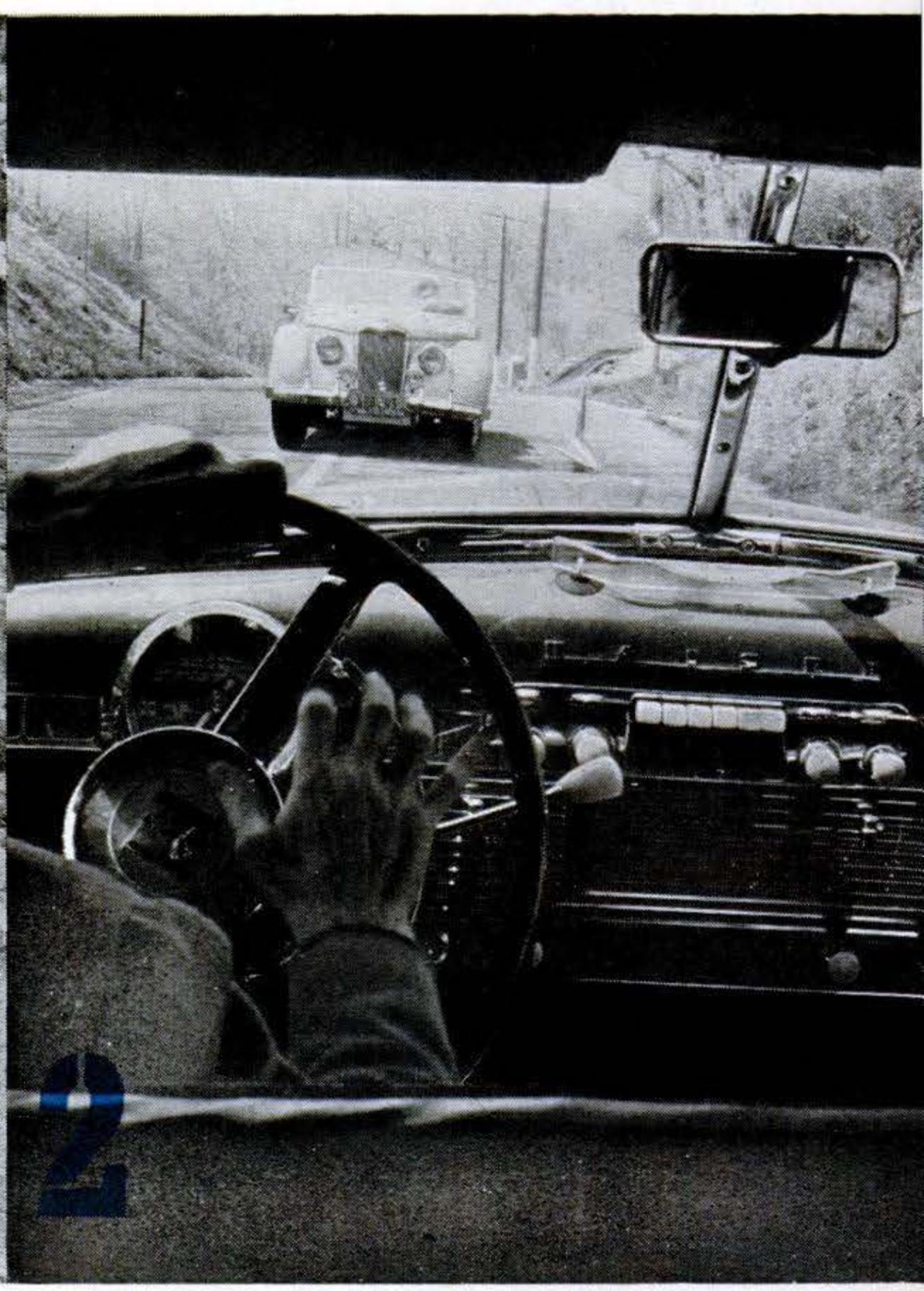
Copyrighted material

5 DON'TS for Drivers

If you want to drive and stay alive, these photos of the most dangerous highway mistakes show you what not to do.



Passing on the wrong side while the driver of the car on the left stubbornly hugs the center line and refuses to move over is one of the commonest—and deadliest—driving errors.



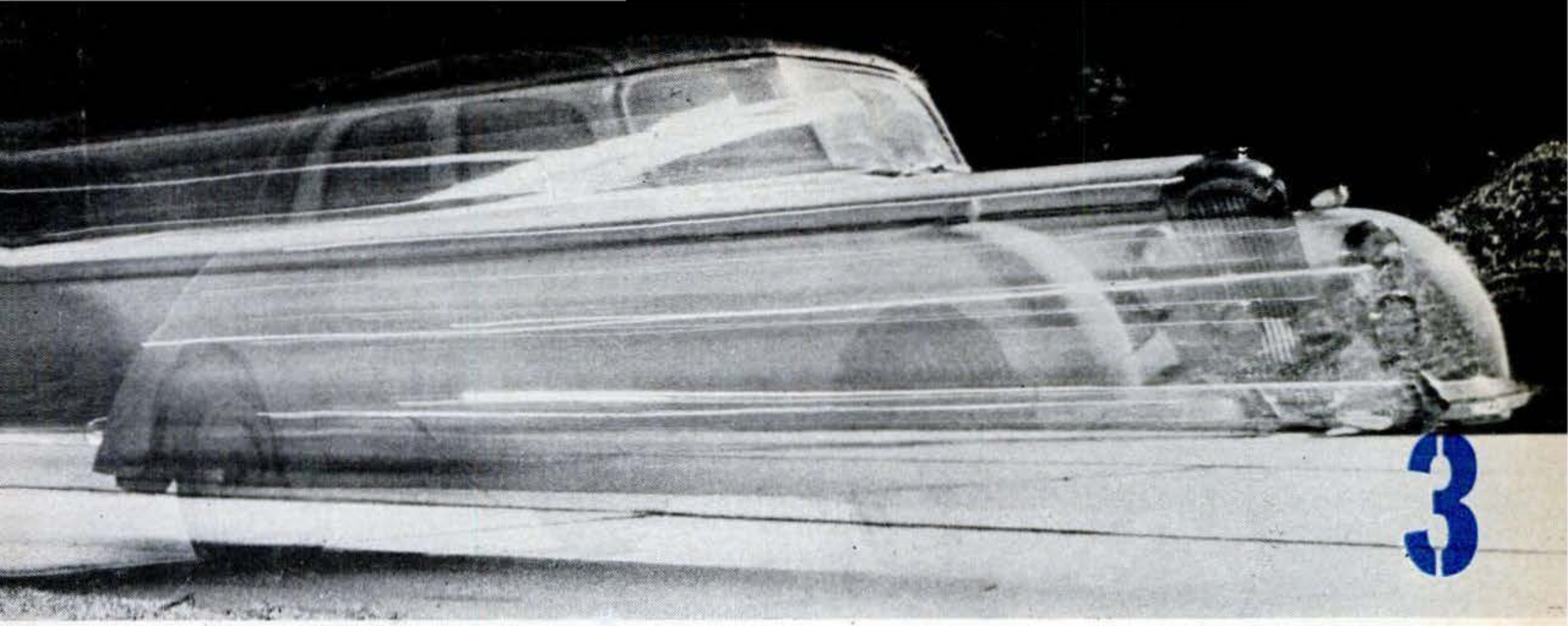
Driving astraddle of the center line is another death-inviting habit. The man hogging the road here may want room in case of a blowout, but he's taking chances, not precautions.

IT LOOKS as though someone is heading for the hospital—or worse. The five pictures on these two pages eloquently illustrate common driving mistakes that account for a substantial portion of the terrible toll of lives on American streets and highways—35,000 people killed each year.

A sixth common error is forgetting that it takes four times as much braking energy to stop a car at 40 m.p.h. as it does at 20.

The "accidents" look real, but they aren't. The cars were photographed standing still by the Standard Oil Co. of New Jersey as part of a safety campaign. Then the car "in motion" was backed up slowly while the shutter of the camera was left open.

Copyrighted material



Speeding is the Number One highway killer. It took 13,300 lives last year. Observing the legal limit isn't enough—30 m.p.h. can be too fast for some road or traffic conditions.

Driving off the road kills 7,000 persons a year. Blinding lights or swinging too wide when passing may jeopardize the other fellow. And don't forget the centrifugal force on curves.

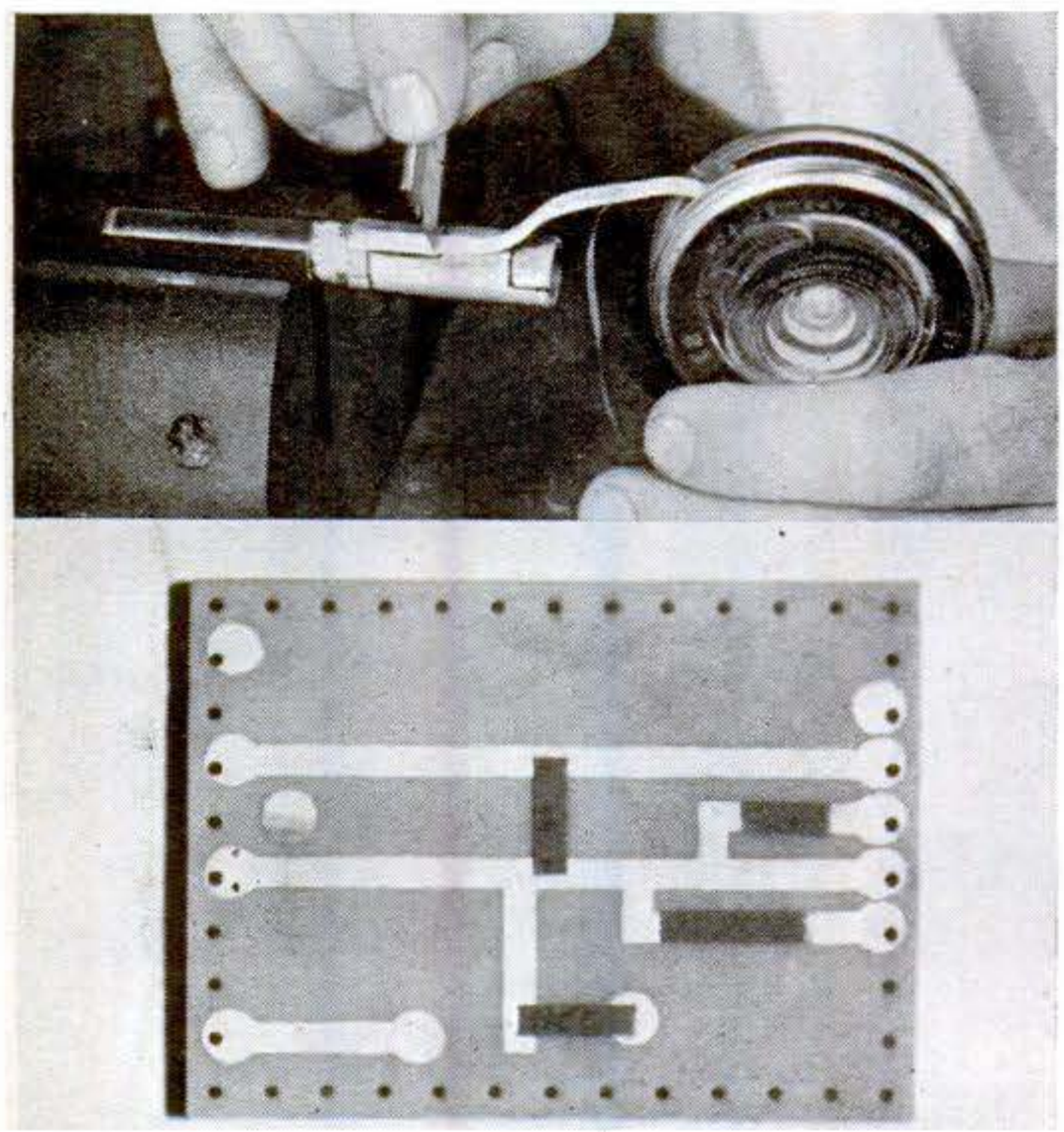
That hand signal in the car broadside to you caused this one. The driver waved for a right turn—and then swung left. Improper signaling causes tens of thousands of smashups.

Crawling Cutter Speeds Coal Mining

THIS German coal-cutting machine could be used in anthracite mining in Pennsylvania, say U. S. Bureau of Mines experts who have tested and adapted it. The husky midget weighs only 1½ tons. Its cutter bar, powered by compressed air instead of electricity for safety, operates at any angle. Bureau of Mines improvements include substituting a miniature tractor tread for wheels and adding dust-control attachments.

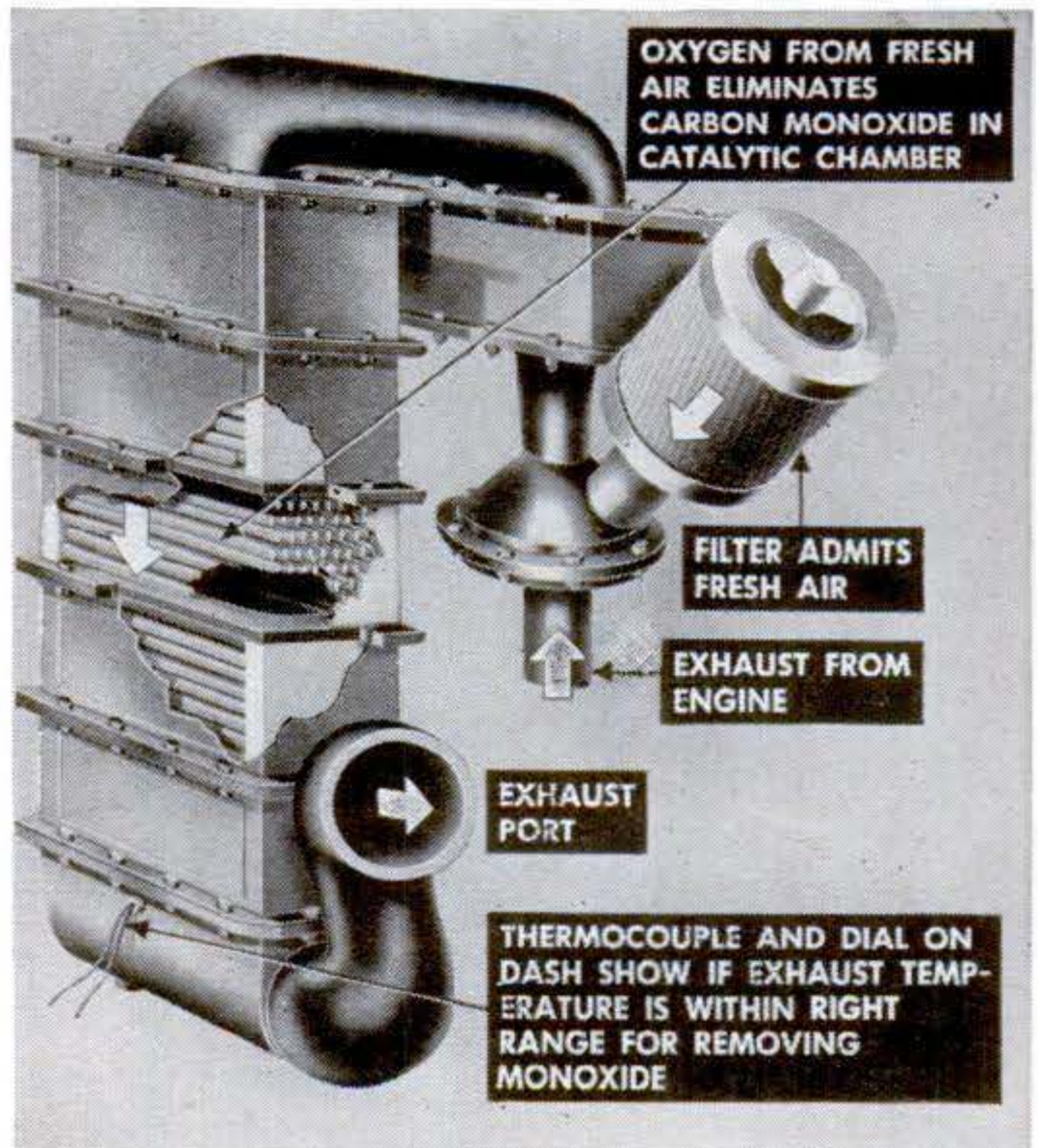
Tape Forms Resistors

ADHESIVE tape cut from a roll (top view) now forms the resistances in "printed" electric circuits (lower view). It is made of asbestos paper coated with carbon black or graphite. Usual length is one-half inch; for different resistance values, coatings vary.

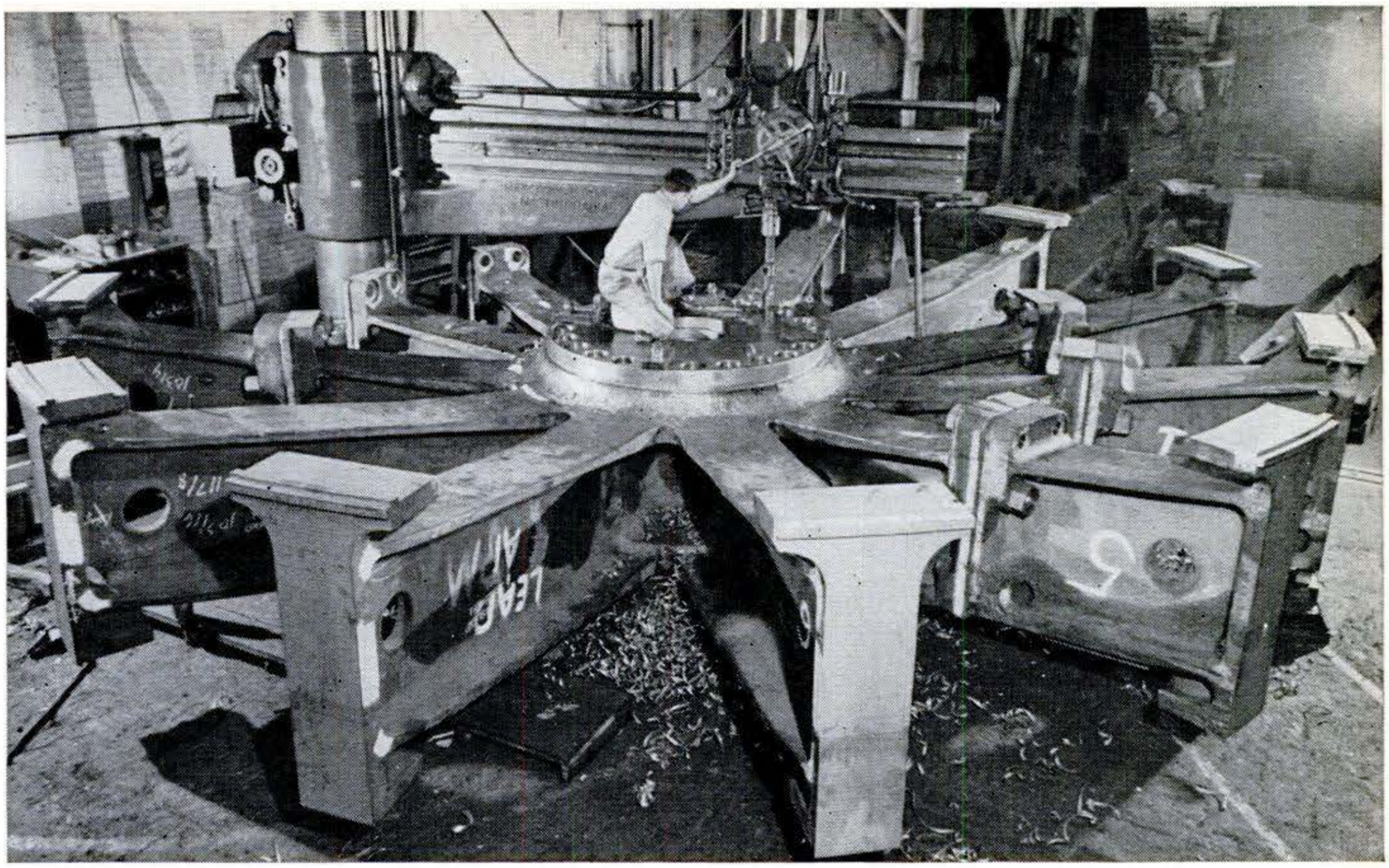


Muffler Makes Exhaust Safe

BY MIXING fresh air with exhaust gas in a catalytic chamber, the Houdry muffler below eliminates the lethal carbon monoxide. Following successful operation indoors on factory lift trucks, it will soon be adapted for use on motor cars.

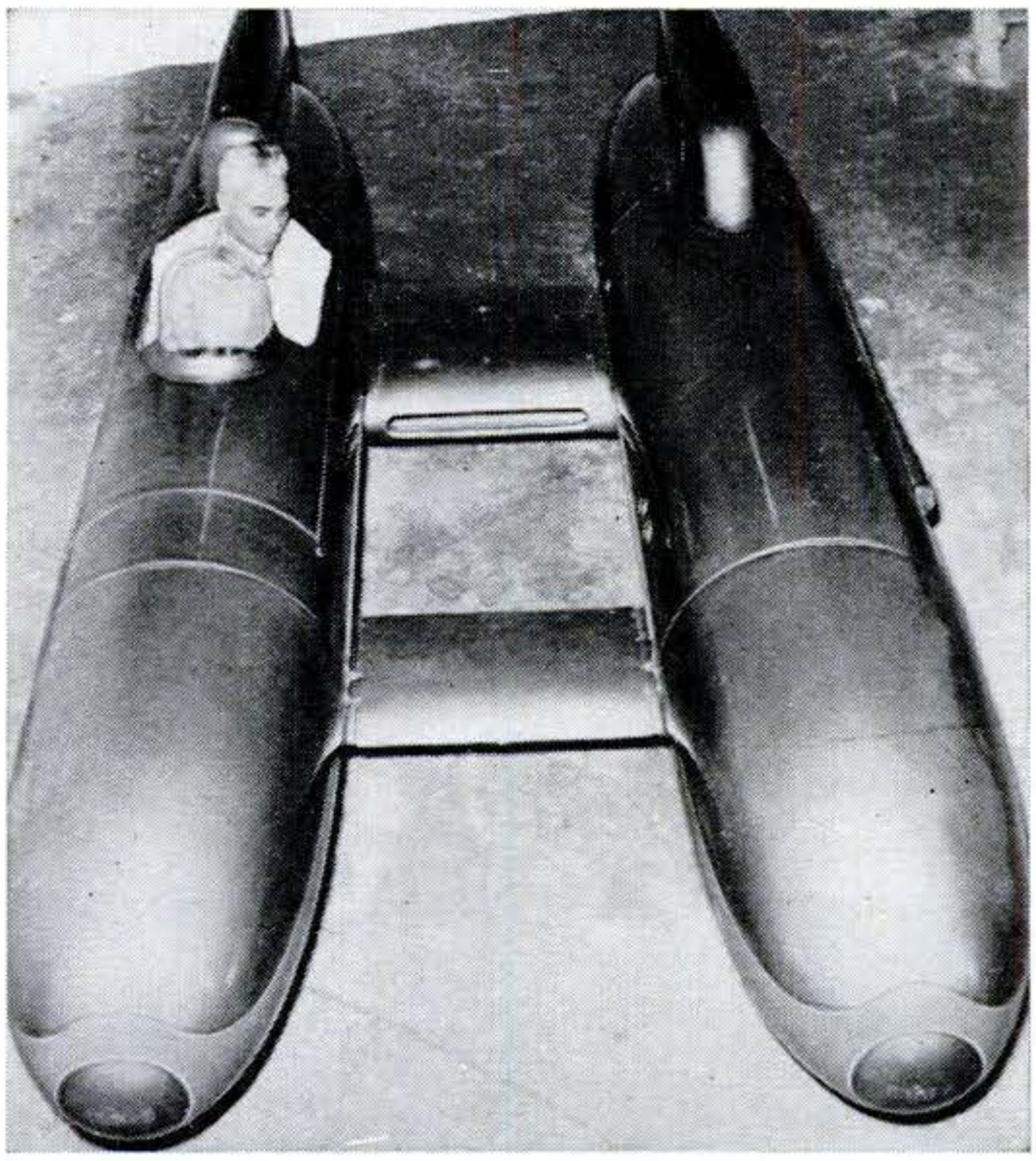


Copyrighted material



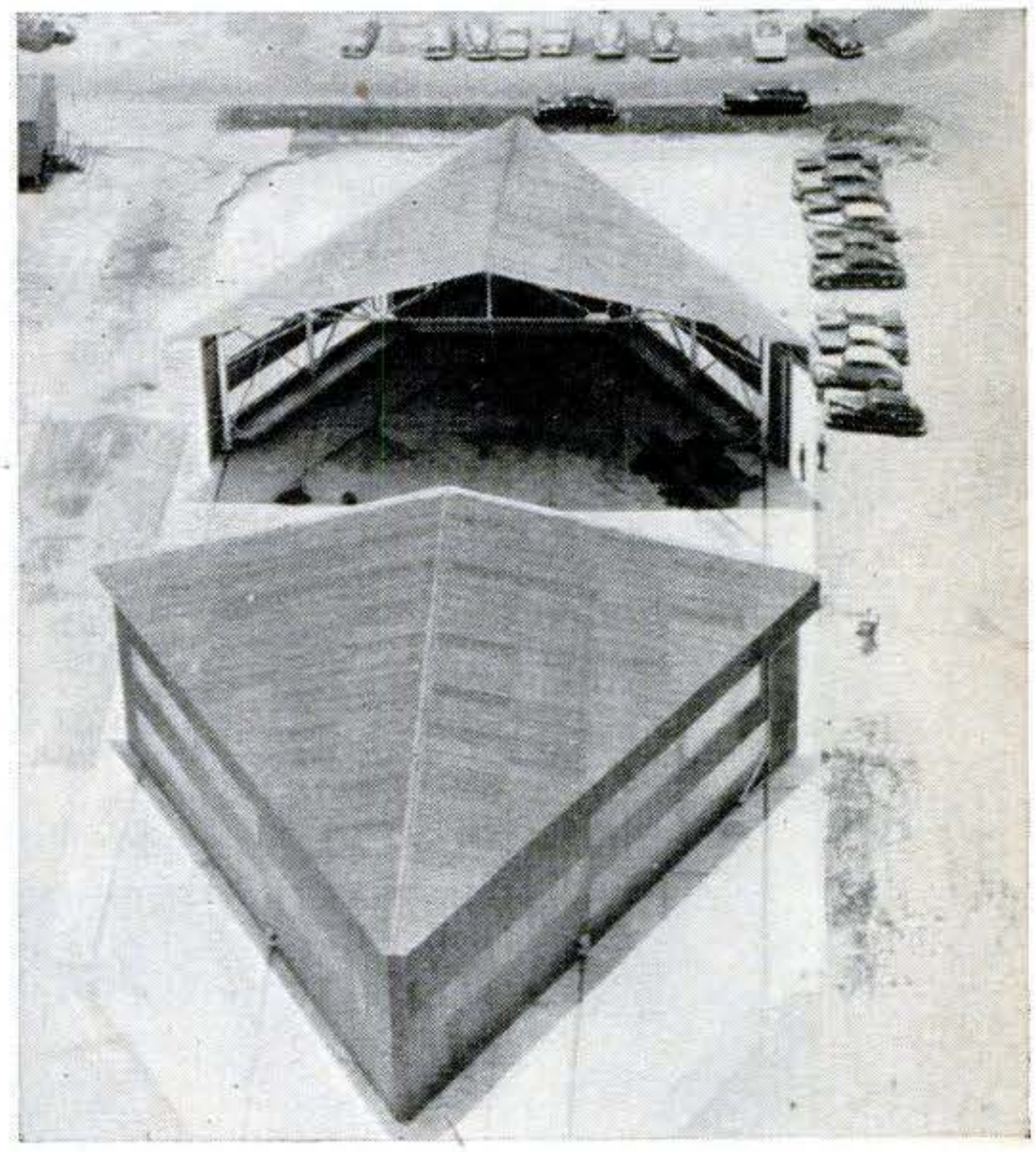
Big Spokes for Big Wheel

MEASURING 25 feet in diameter, the 55-ton "spider" above will form the spokes of a 215-ton rotor in a giant hydroelectric generator at Buggs Island, Va. A waterwheel and 34-ton shaft will spin the Westinghouse rotor to supply power for the nation's defense program. Ends of six of the spider's arms are removable, so that it can pass under bridges en route to its destination.



"Torpedo" Car Hits 191 M.P.H.

EUROPE'S hottest hot rod has set two speed records in Italy—186.25 m.p.h. for a mile, 191.34 m.p.h. for a kilometer. Its builder and driver, Piero Taruffi, occupies one of the car's twin torpedo-shaped hulls. The other houses the 280-hp. motor.



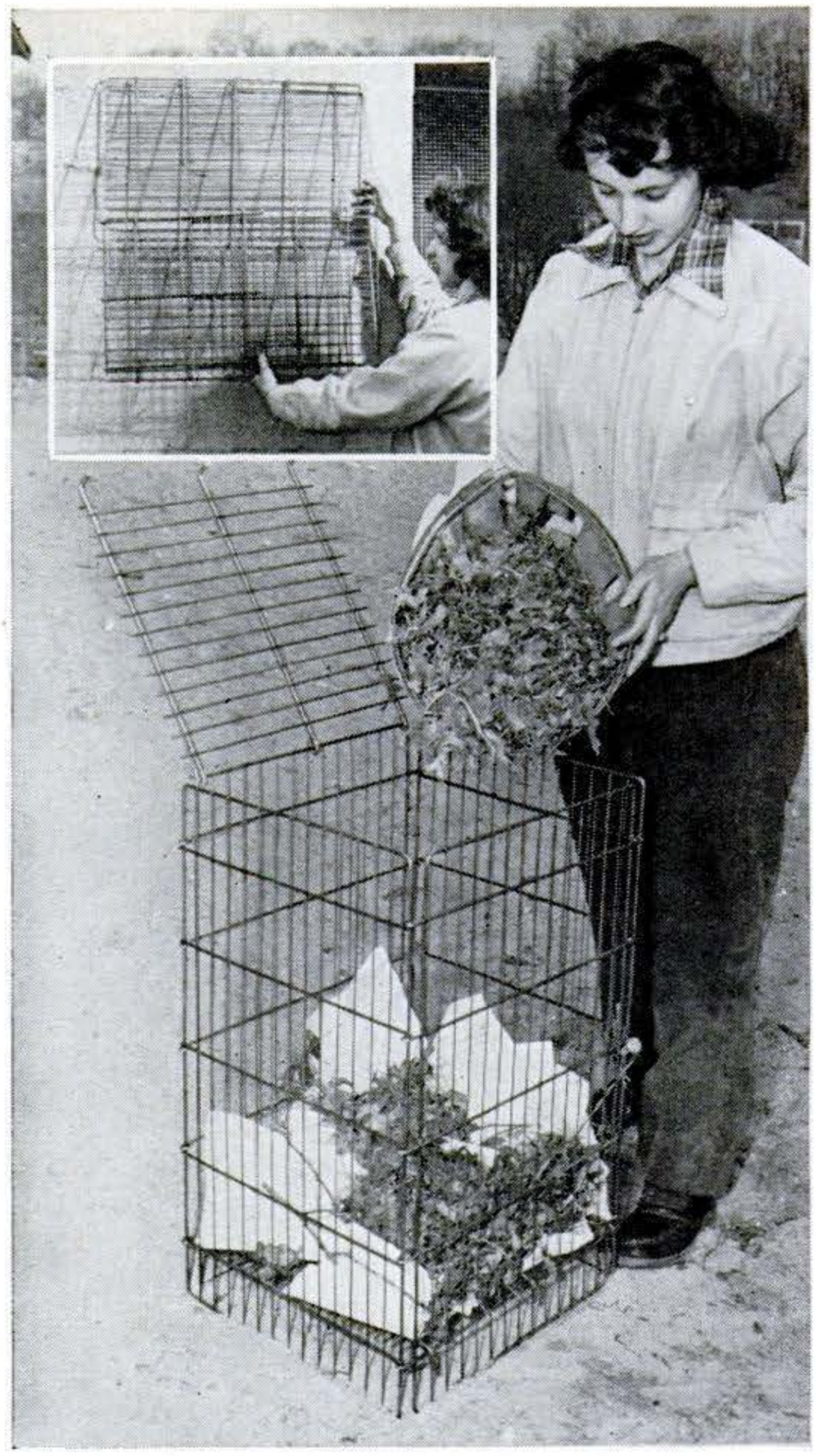
Hangar Shuts Up Like Clam

"CLAMSHELL" is what Marines call the world's first mobile hangar—because it works like one. While it's open, Marine planes at Cherry Point, N. C., taxi into place. Then, on wheels and tracks, the self-propelled halves roll together.

Copyrighted material

Aids to Modern Living

Ladder Balance Bar. Clamp this bar to your ladder and you've something solid to hang onto when washing or painting ceilings. *MacLeod Safety Device, Libertyville, Ill.*

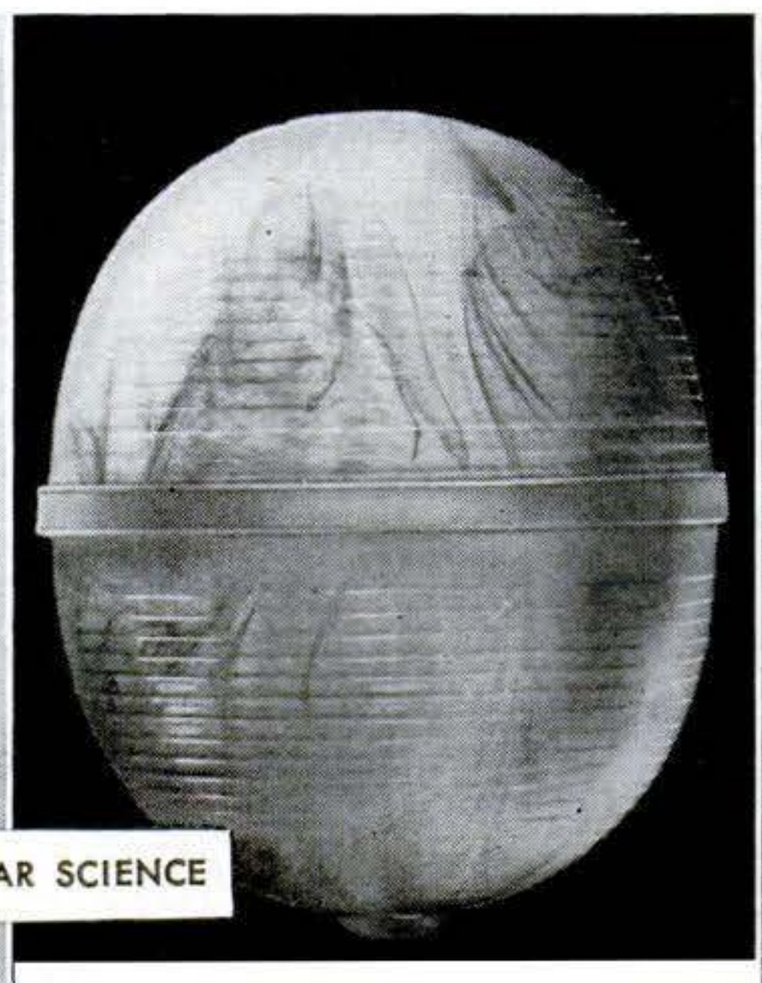


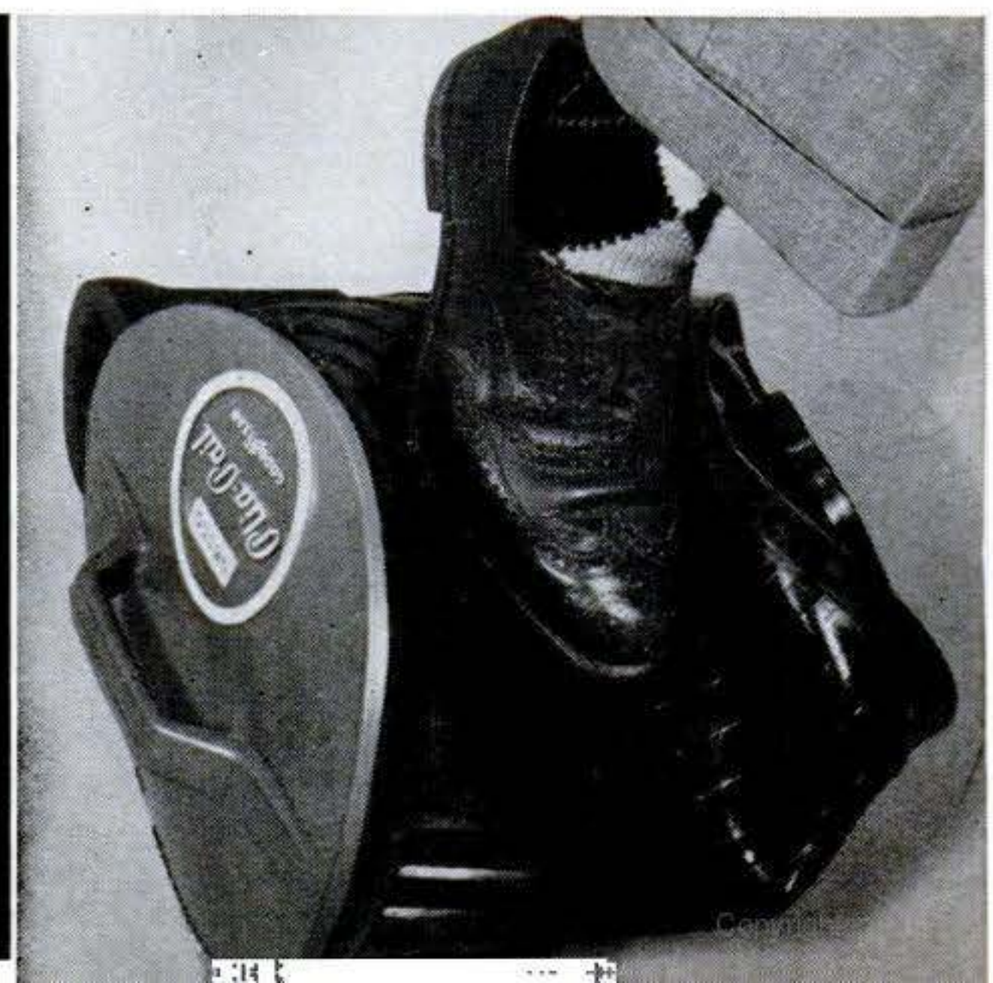
Fold-Away Rubbish Burner. Trash burners add no beauty to the landscape—here's one that hangs out of sight when not in use. *Crown Wire Mfg. Corp., New York City.*

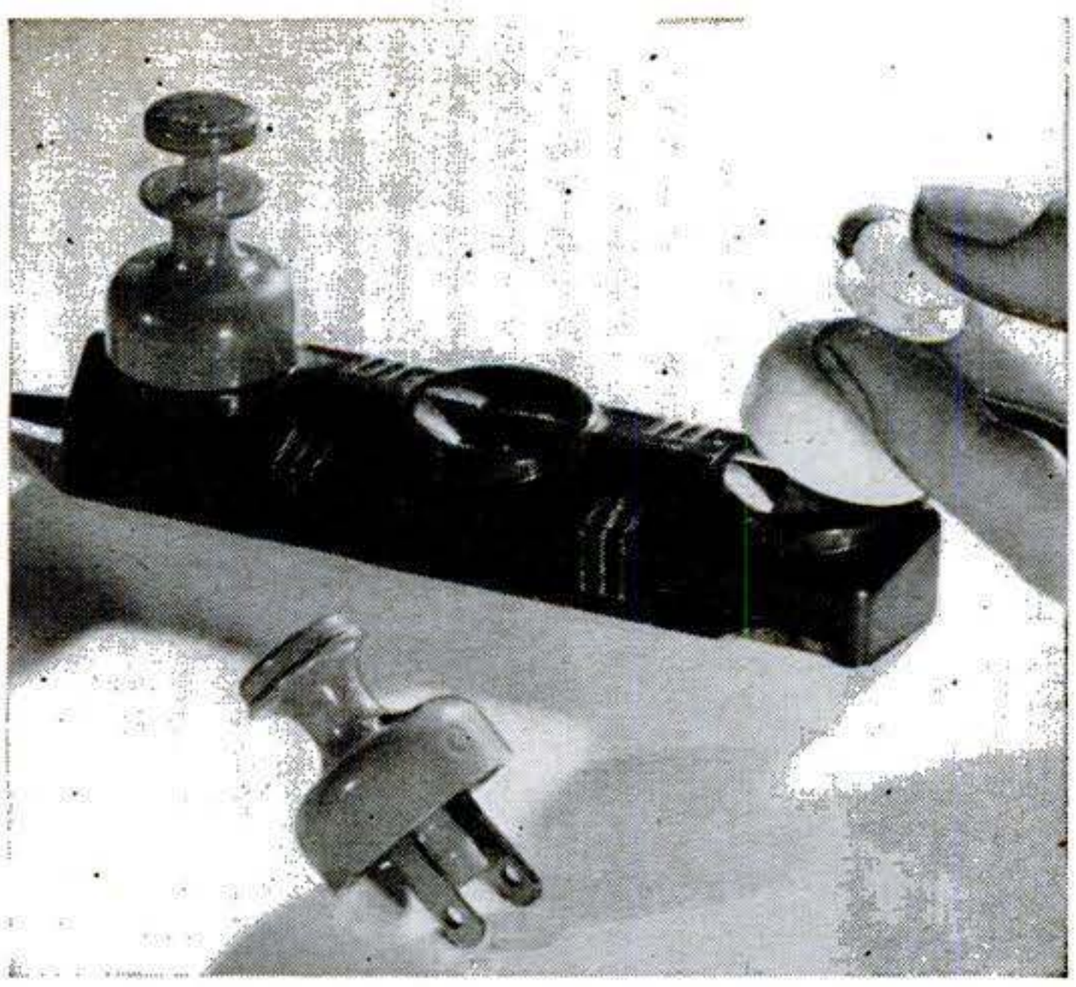
Shaving Aid. Screwed on a shaving-cream tube, this sponge-rubber-and-plastic cap becomes the shaving brush. Moisten sponge, press tube and squeeze lather out. *Lathercap, Brooklyn, N. Y.*

Tank Ball. This plastic float for toilet tanks is said to be permanently watertight. It won't corrode and is unaffected by hard or brackish water. *Amerline, Inc., Chicago.*

Pliable Garbage Pail. All rubber, this garbage can is light to handle, dentproof, rustproof and noiseless. Its top locks in place, holding in odors. *Nesco, Inc., Chicago.*

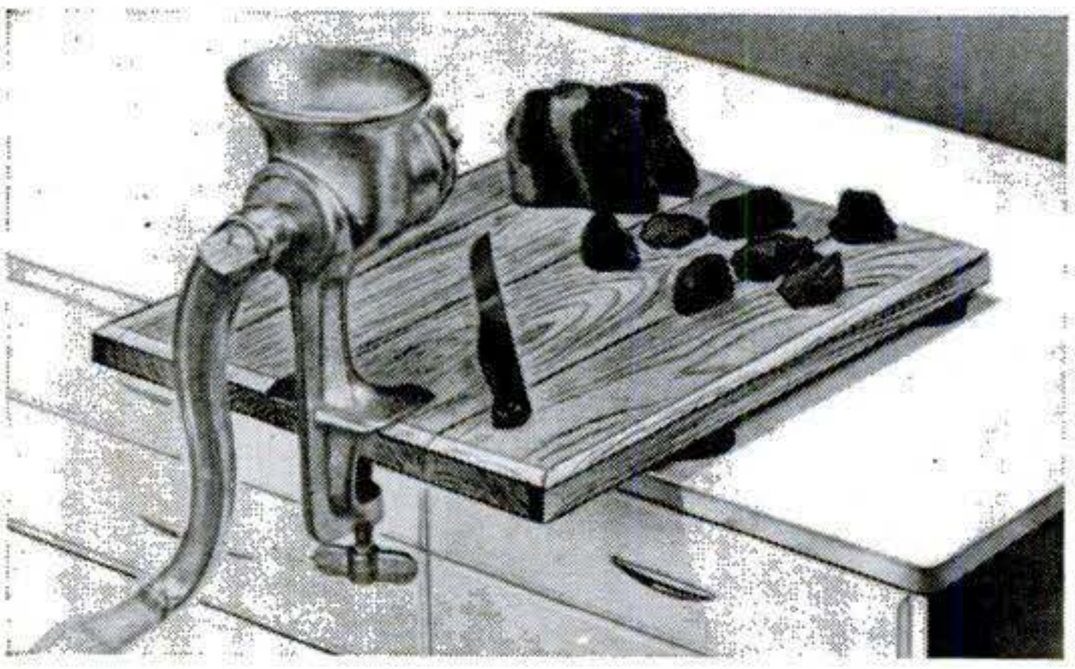




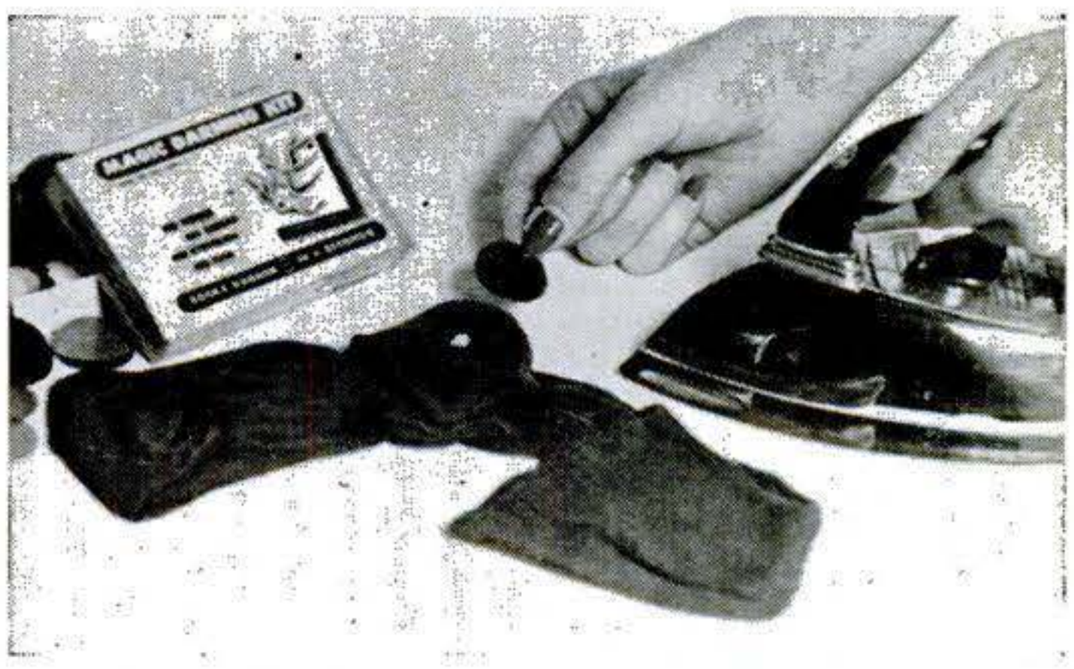


Pushbutton Plug. Press down on the button in this plug and a plunger releases it from socket without strain on wires or contacts. *Safety Push Plug Co., Toledo.*

One-Piece Handle. Sterling-silver knife handles won't loosen up when made by new process using seamless tubes instead of soldered pieces. *Gorham Co., Providence, R. I.*



Utility Board. This cutting board with suction-cup feet and extending edge provides place to clamp food chopper. *General Slicing Machine Co., Walden, N. Y.*

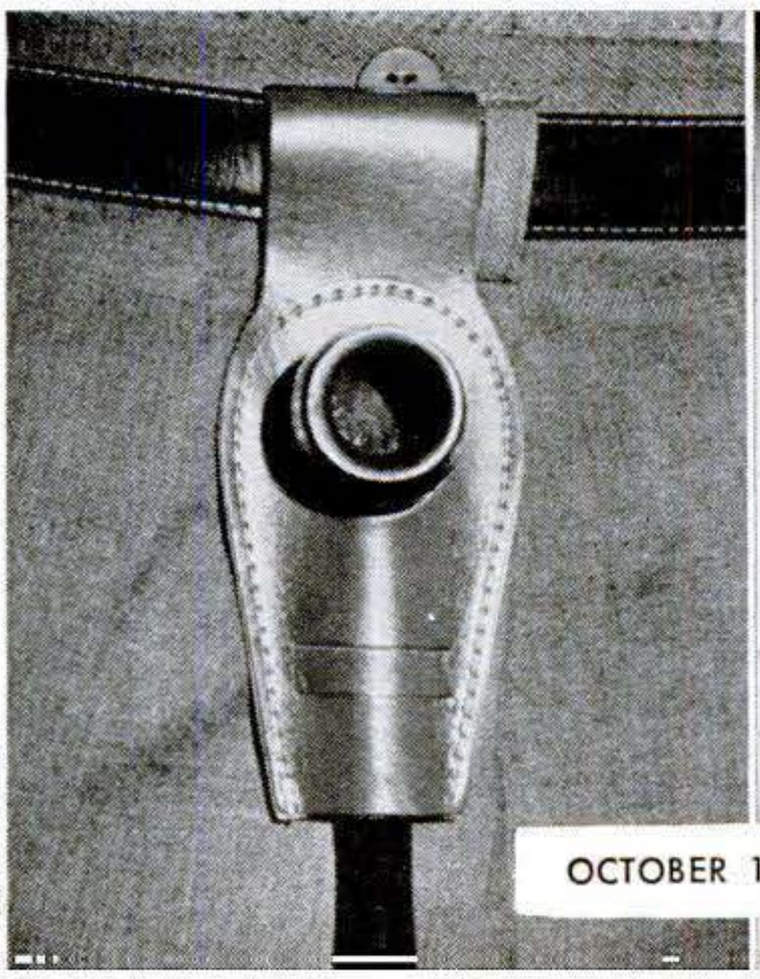


Darning Kit. It takes only eight seconds' time and a hot iron to close a hole in your sock with these knitted-fabric patches. *Plasti-Stitch, Inc., New York City.*

Vacuum-Seal Jars. Just press in place the aluminum disks and rubber rings that seal these refrigerator jars, and foods keep fresh for weeks. *The Silex Co., Hartford, Conn.*

Pipe Holster. Hung from your belt, this holder provides a parking place for your pipe while you're working around the house, golfing or fishing. *The Village Store, Lake Placid, N. Y.*

Long-Range Mop. Pull this duster with the wooly yarn head over a broom to reach cobwebs on the ceiling, or dust furniture legs without stooping. *Magic Mop Co., Chicago.*



ghted material

Outdoor Model Railroad Runs

Fantastically intricate models burn coal, operate on live steam and chug around California hills like big ones.

TO GET a ride on this railroad, you don't buy a ticket—you build a locomotive. One that runs. That's the club's way of keeping out the dabblers and the slackers—you have to work before you can play.

These rare model railroaders have another odd notion—they think steam engines should run on steam. Live, hot, high-pressure stuff, ready to blow its boiler's top if you'd let it. Hence the club's name, the Golden Gate Live Steamers.

Most any Sunday afternoon you can find its members in the rolling hills of Oakland, Calif., riding around a sprawling elevated track behind a locomotive that's never been on a dynamometer but whose drawbar pull is exactly eight grown men and two boys.

The only thing small is the scale. The thrills are full-size. Side rods flash, and the stack spits black. You can feel the heat of the firebox on your face, and hear the labored chug on a long upgrade. You can smell the hot, moist pungence of live steam pushing up close to the safety limit, and the acrid odor of bearing oil running hot under a load many times the engine's weight. And all the time you keep your eyes glued to the rising needle on the pressure gauge.

There Are Breakdowns, Too

Then the heart-breaking moment when the crown sheet threatens to run dry and the boiler is in danger of blowing, or an injector valve fouls and the water pressure drops. Back goes the engine to the club's repair yards—the basement workshop of the club's originator, Vic Shattock.

Shattock, a Southern Pacific plumbing supervisor, got the idea for the club when he was tooling locomotives in his basement.

Copyrighted material

Biggest live-steam locomotive is 0-6-0 Southern Pacific switcher that hauls 10 men on four flatcars. Built to one-inch scale, engine and tender weigh 250 pounds, measure five feet long.

on Real Steam

He wanted an outdoor setting, where his engines would have light and air and space, and he wanted only members who loved steam locomotives well enough to build one.

Railroad Donates Timbers

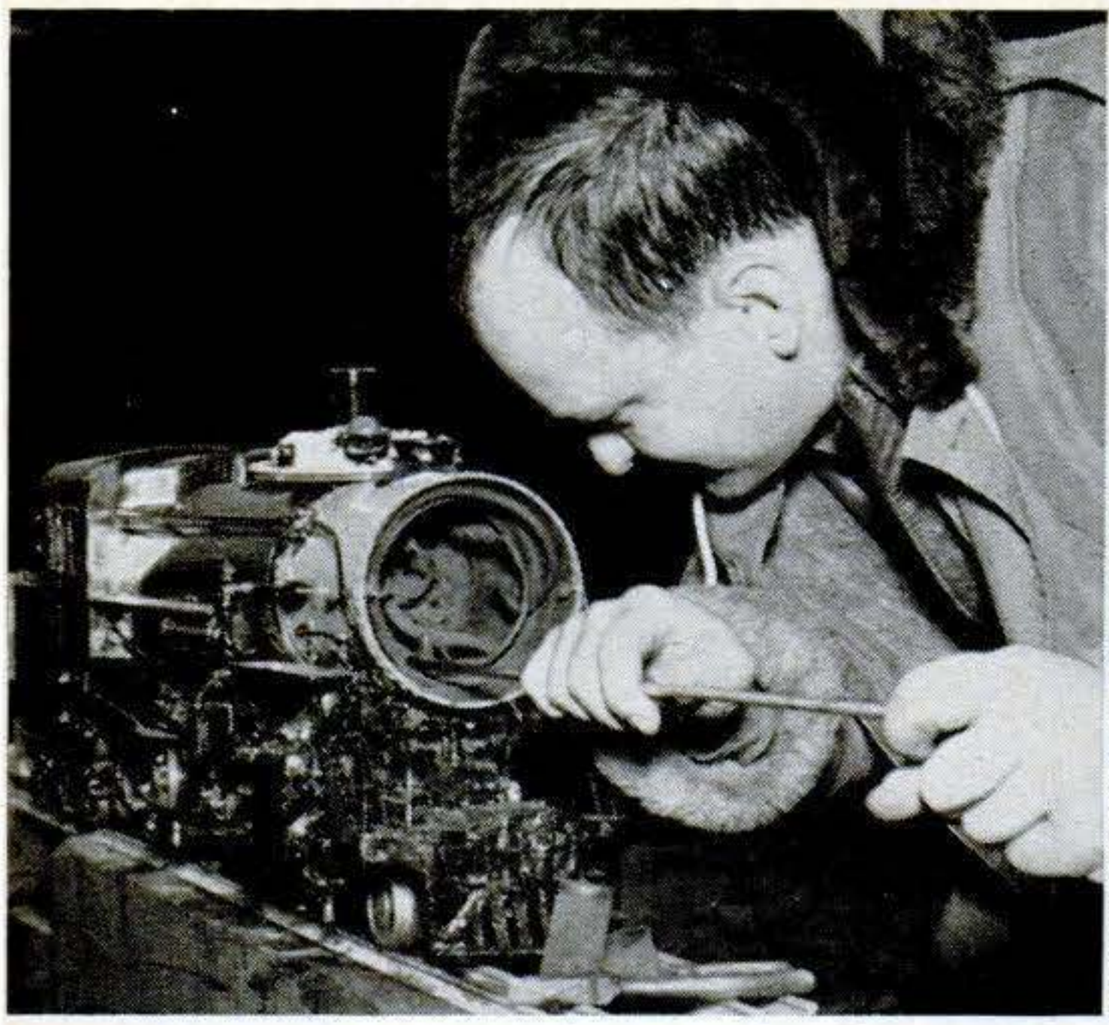
Shattock asked his friends and turned up a handful who showed interest. The Eastbay Regional Parks Board came up with a site in Redwood Park just outside downtown Oakland. The Southern Pacific Railroad donated discarded rail ties and bridge timbers for construction of the big track.

Then the work began. Scott E. Gordon, present club president and professionally a railroad civil engineer, mapped the site. From his plans, the track took shape. A total of 147 wood piers rose on beds of crushed rock. Bridge ties became beams to support the track, and light aluminum rails were spiked down on slender wood ties.

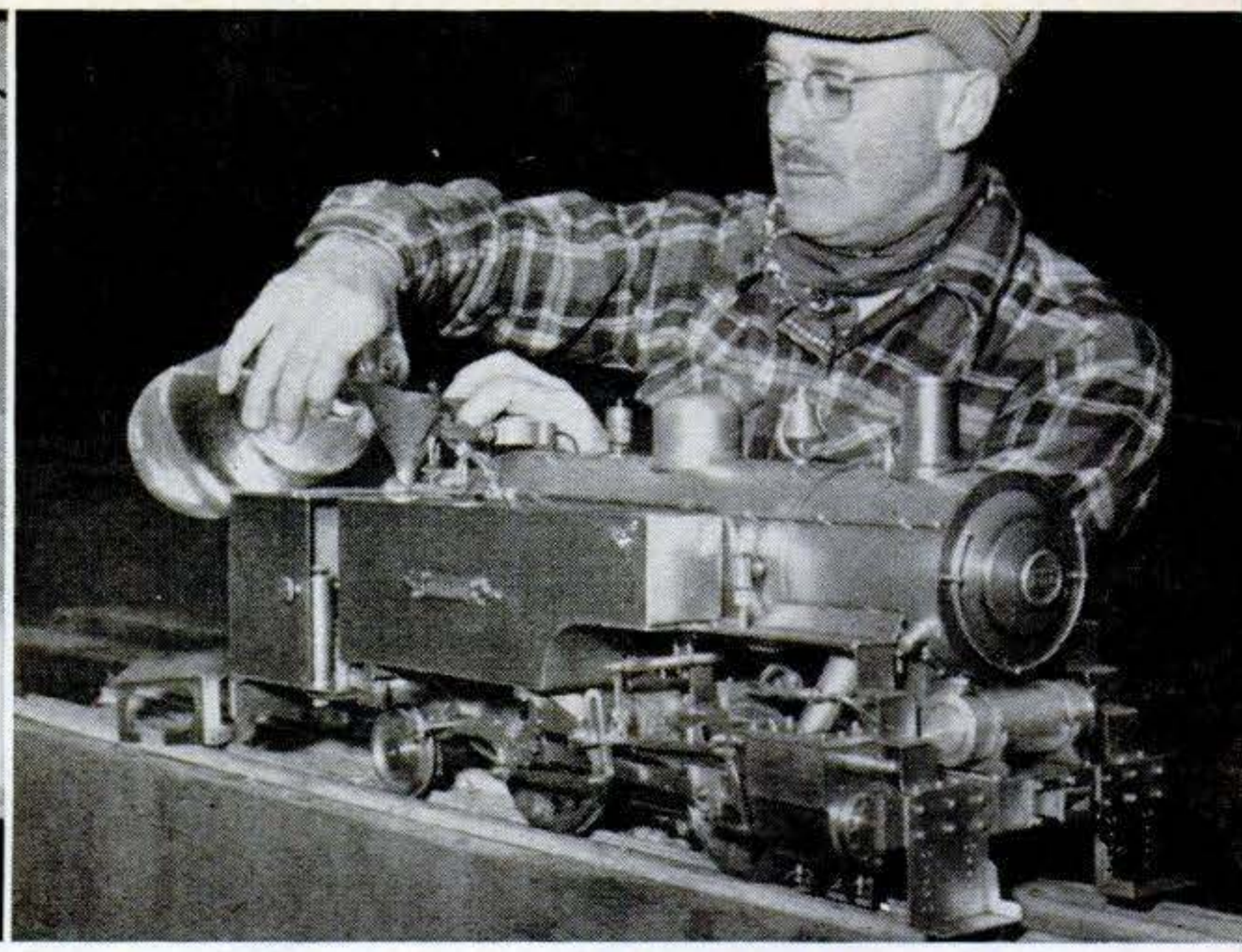
That was three years ago. Now the club

Special four-rail track takes three gauges of locomotives—2½-inch gauge for ½-inch-to-the-foot scale; 3½-inch gauge for ¾-inch scale; and 4¾-inch gauge for the big one-inchers.

Copyrighted material



Tiny boiler tubes must be periodically scraped clean with gun rod to keep them from fouling. Use of distilled water cuts down scale deposit.



Most models are reproductions, but this dockside switcher is an original design. It weighs 100 pounds, burns wood alcohol instead of coal.

boasts 49 members and 1,331 feet of continuous track. The trestle's 30-inch height permits engineers and passengers to ride side-saddle behind their chugging engines on cushion-padded flatcars. Four rails laid side by side take locomotives of three gauges —2½ inches, 3½ inches and 4¾ inches.

Down long straightaways and around carefully banked curves glide precision-built scale models of prototype locomotives—the big compound articulated Mallets, mountain-climbing Mikados, Pacifics, Hudsons, and the homely dockside switchers.

Aluminum rails are spiked down on eight-inch wood ties. Continuous 30-inch-high, 1,331-foot-long trestle is made of old railroad bridge ties, donated by Southern Pacific, resting on 147 piers.

Engines Take Thousands of Hours

All of them run—there are no non-operating showpieces on this railroad—and they all run on steam. Normal running pressure is around 100 pounds, with the safety valve set to open at about 120. Boilers, usually made of brazed copper or welded steel, are first tested at 200 pounds or more.

Most engines burn real coal, either crushed or in the form of briquettes, while a few burn alcohol. On most, all of the parts are fully operating, from the Johnson bar—which does for a steam engine what a gear-shift does for a car—right down to the sand domes and the steam-driven water injectors. And each represents a spare-time investment of 1,000 to 5,000 hours in the most exacting work with lathes, drill presses, hand files—and ten-thousandth-of-an-inch tolerances.

Indoor Tracks Test Locos

Inside Shattock's basement workshop are more examples of the railroaders' craftsmanship. An authentic reproduction of a trackside water tank fills a waiting New York Central "870." An electrically operated turntable reverses locomotives, while a roundhouse shelters a pair of 4-6-2 Pacifics flanked by a pair of 2-8-2 Mikados. Short lengths of test tracks, set up around the walls of the cellar, hold an assortment of engines and

Copyrighted material

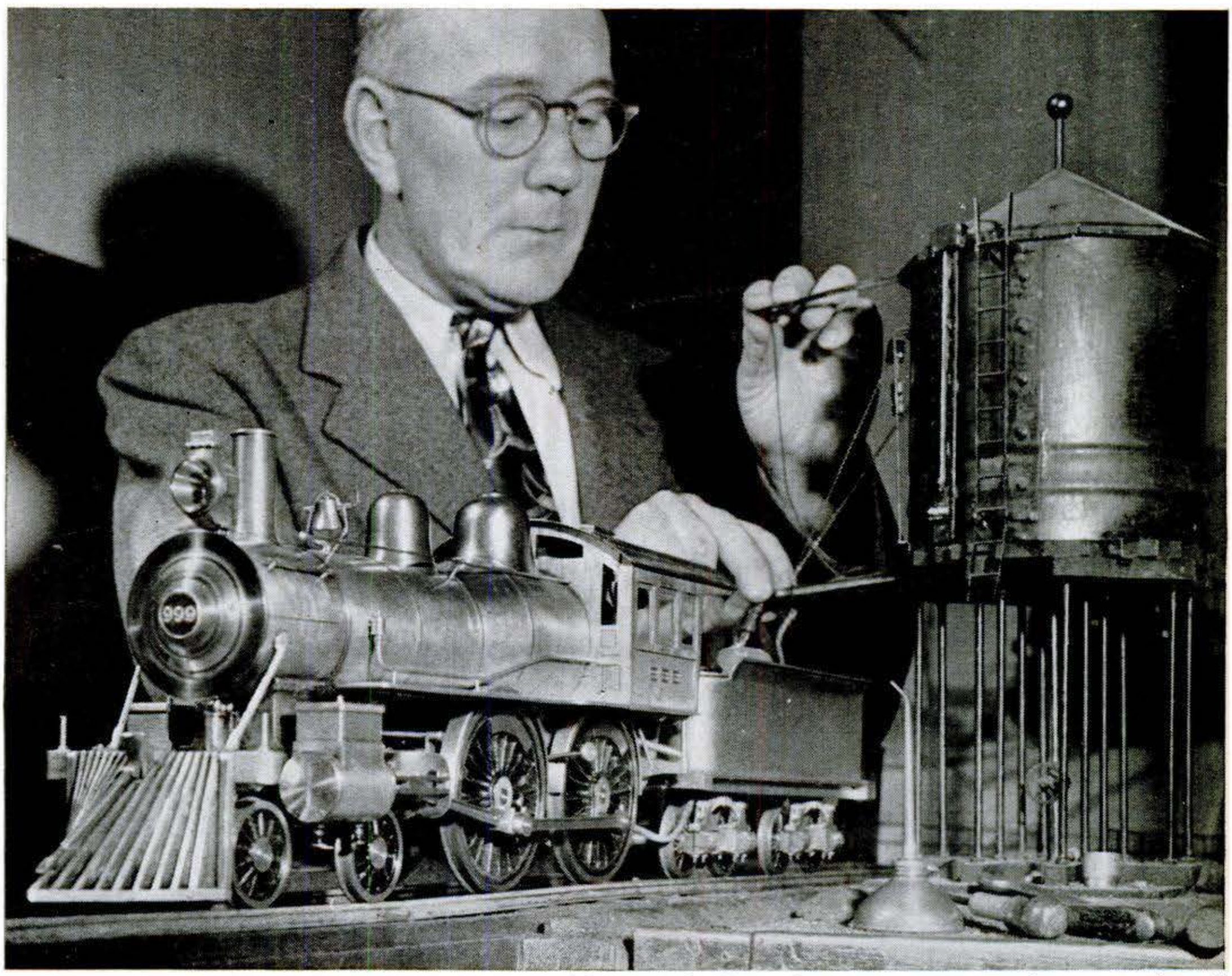
Firing up. Loco gets help from small electric pump that draws air through stack to fan flames. Once fire is going, steam jet creates draft.

Ready to hit the high iron, this mighty 2-8-2 Mikado blows steam as she gets up pressure. Throttle and steam-pressure gauge are in cab.

running gear in various stages of assembly.

But the real railroad is outdoors, where papier-mache and cardboard are no match for the natural scenic beauty. And it runs like any self-respecting railroad should—under its own steam. END

Read how one man runs his mammoth model railroad like a real road in P.S. next month.

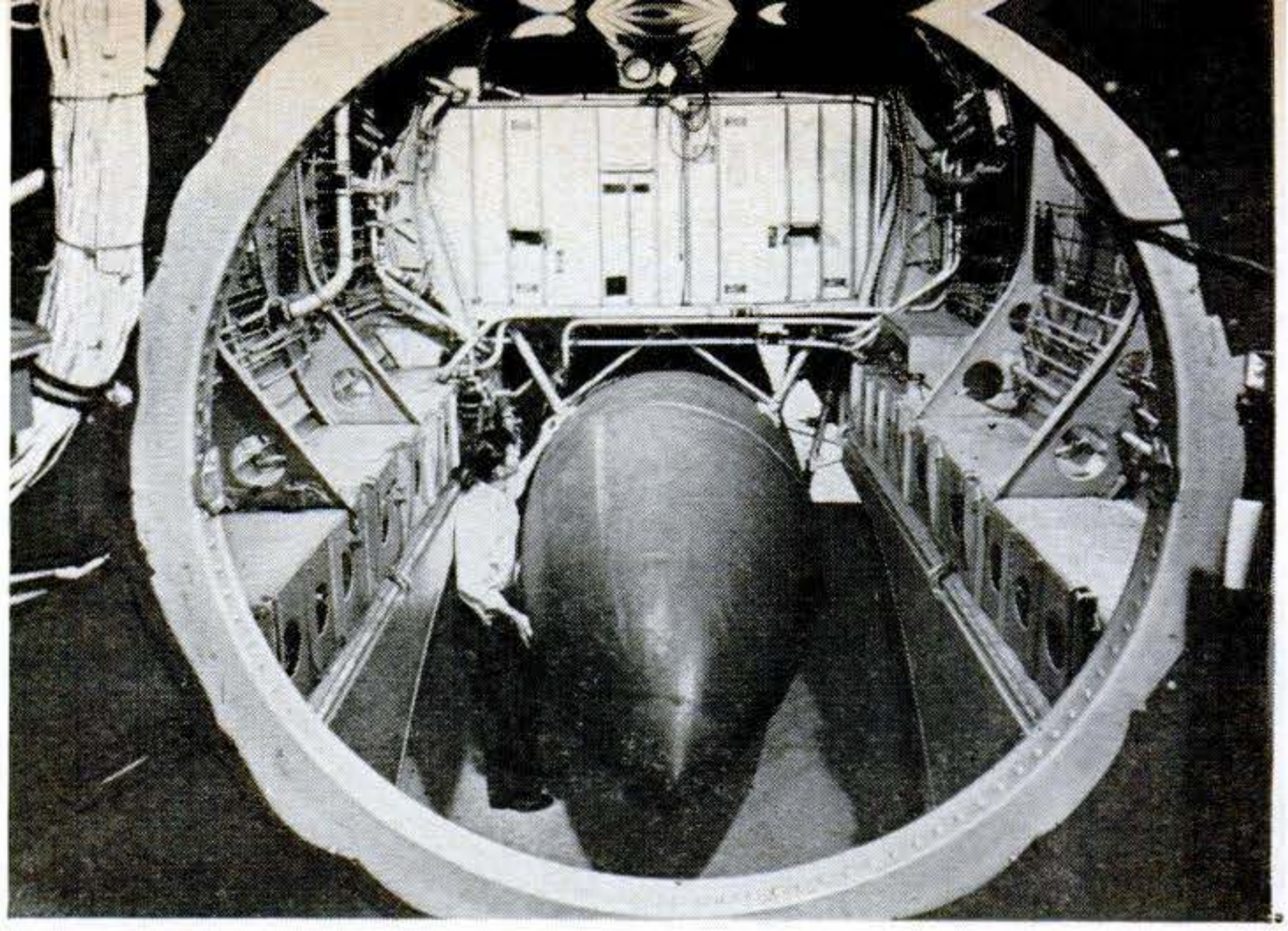


In club's basement workshop, famous old "999" takes on water from replica of familiar trackside tank. Larger version of water tank will be built for use by members on outdoor track.

Copyrighted material

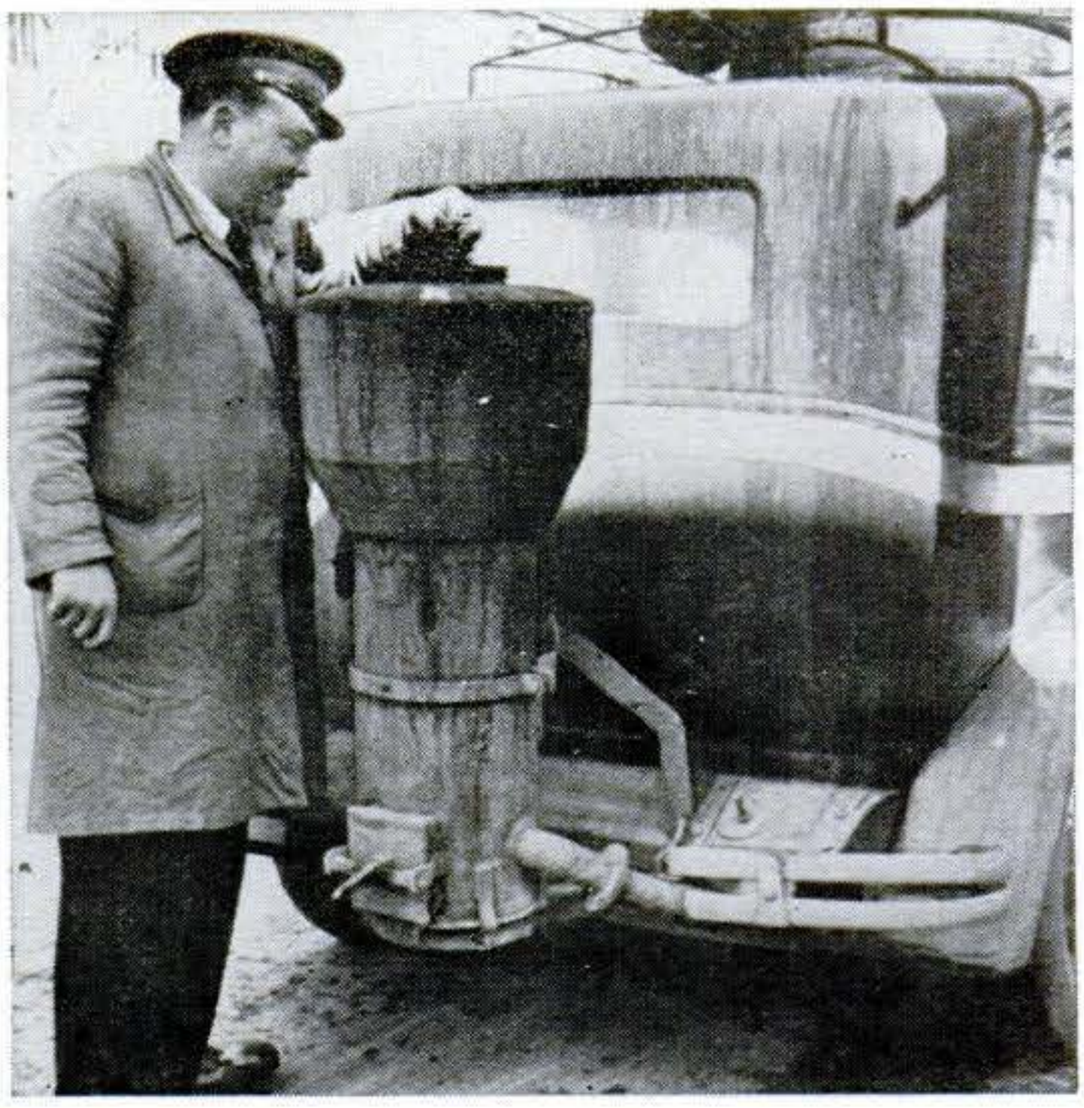
Big Bomb Tight Fit in B-29 Bomb Bays

HERE'S a 44,000-lb. blockbuster that's going to make an extra big hole in the ground when it's dropped for real. So large that it takes up space in two bomb bays and still sticks out of the plane, the giant bomb is shown at right attached to the specially designed cradle needed to hold it aboard a Boeing B-29 Superfortress.



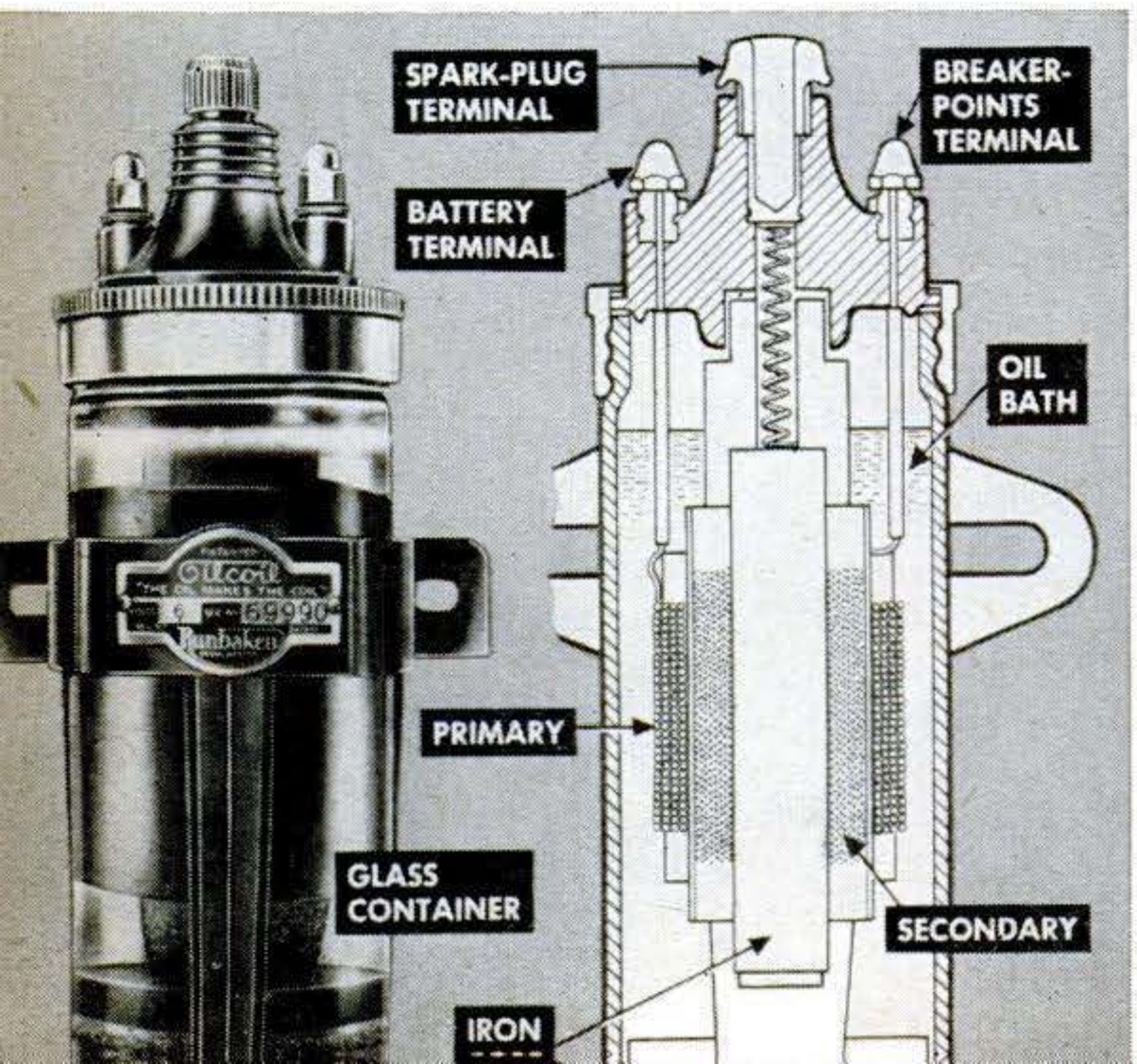
Stapler Fastens Building Rods

STEEL rods for reinforcing concrete are usually wired together laboriously by hand. Now a new German-made machine does the job at the squeeze of the hand—just like using an office stapler to join papers.



Nutshells Power Taxicab

SPAIN'S answer to the scarcity of gasoline is—Nuts. Shells from the plentiful almond are being burned in converters to provide a combustible gas that can power automobiles like the taxicab above.



Oil Cools Auto Ignition Coil

THIS new auto ignition coil is insulated and cooled by circulating oil, just like giant transformers in power stations. The oil-bathed windings are said to produce higher voltages, with a hotter and fatter spark at the plug gap. This improves acceleration and starting and increases gas mileage by firing fuel mixtures that might otherwise misfire or refuse to ignite at all.

The outer covering is tough transparent glass, which reduces electrical losses metal containers sometimes cause. Oilcoil, made in England, is sold in this country by Harry H. Lederer Co., Los Angeles.

Copyrighted material

How the Colt .45 Automatic Works

1 Slide and barrel, locked together, are pulled to rear. Link pulls barrel down, stops it. Slide continues to rear, cocks hammer, allows spring to push up cartridge.

2 Releasing slide feeds cartridge into chamber. Barrel returns to firing position.

3 Trigger is squeezed, presses against sear.

4 Bottom of pivoted sear moves to rear, releases hammer.

5 Hammer falls, striking base of firing pin.

6 Firing pin flies forward through breechblock, striking primer of cartridge and exploding it.

7 Recoil drives barrel and slide to rear. Loading-and-cocking procedure is automatically repeated.

THE famous Government Model Colt .45 is a deadly weapon for close fighting. It shoots fast and hard—the heavy slug can knock down anything it hits—but is less accurate than the carbine, which is now replacing it.

SAFETY DEVICES

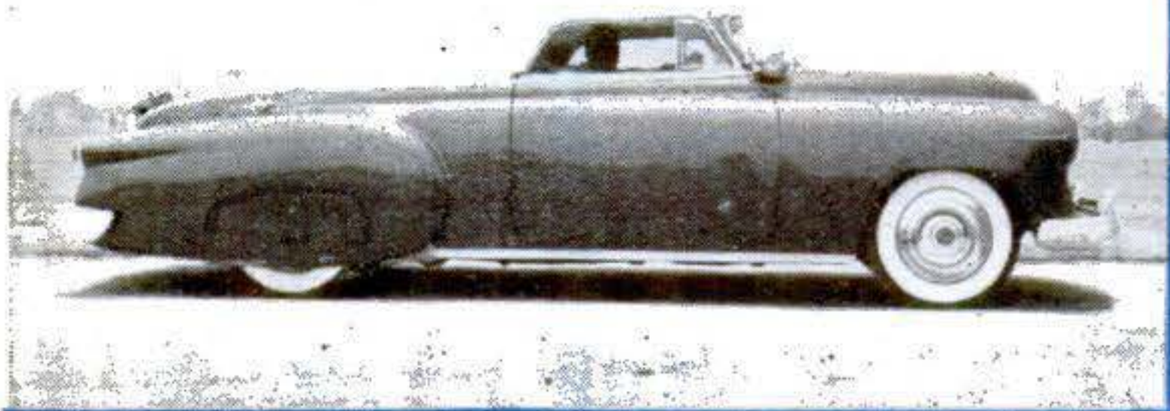
Disconnector stops trigger from acting on sear unless breech is closed.(**a**)
Grip Safety won't let gun fire unless properly held and squeezed.(**b**)
Thumb Safety locks hammer and sear in cocked position.(**c**)

Know Your Weapons

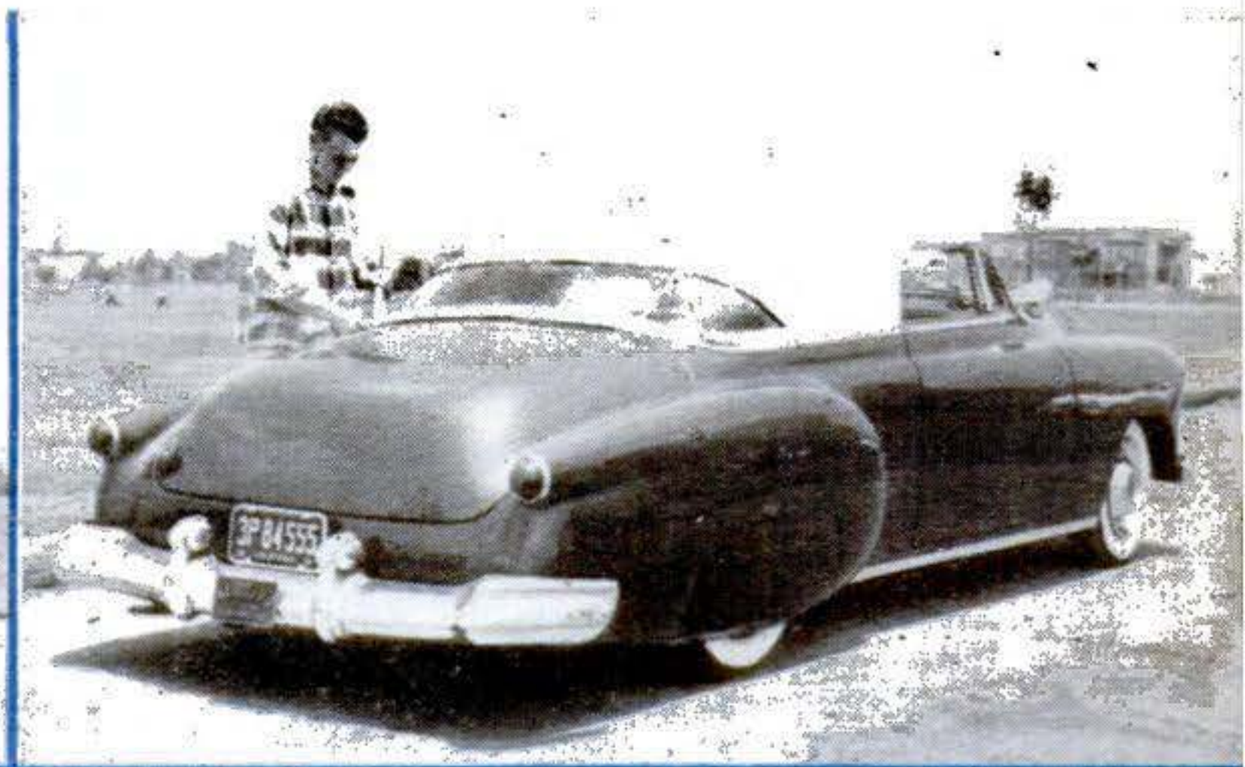
Copyrighted material

These Cars Are

Chevrolet

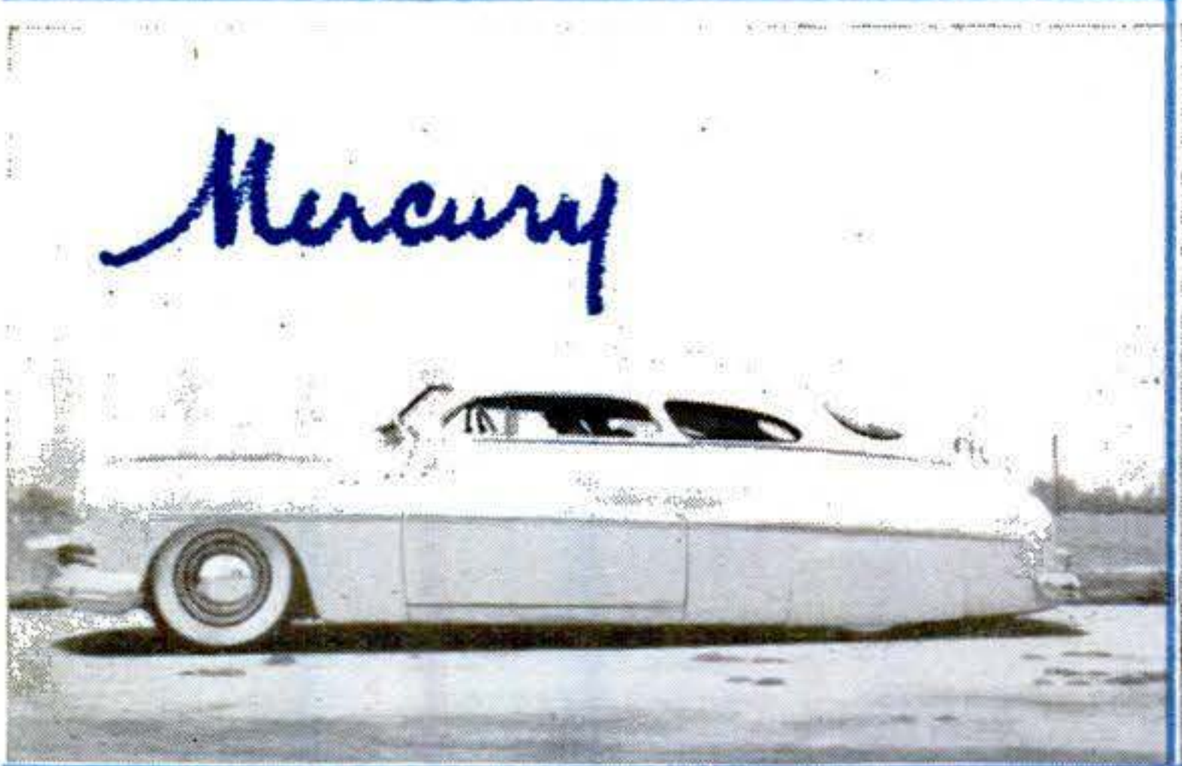


The owner of this '49 Chevrolet convertible didn't know his own car when it emerged from the Barris brothers' custom conversion shop.

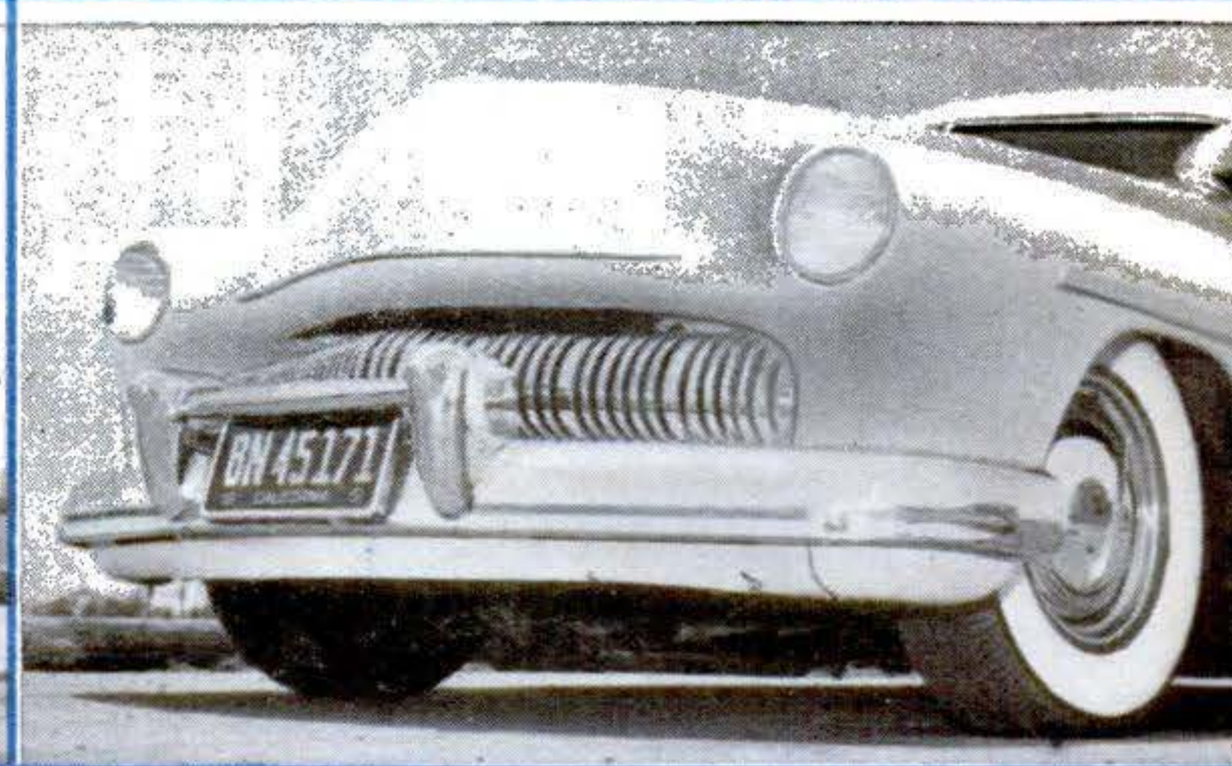


Soft top is built over steel frame. Rear part funnels back to '50 Olds tail lights. Rear windows are removed by unsnapping a padded strip.

Mercury



No '49 Mercury came off the assembly line looking like this individualized job. Top was redesigned and cut down to slant toward the rear.



Grille is one-piece, fits within big, oval jet-like intake. Headlights and front end were molded as single piece for smooth appearance.

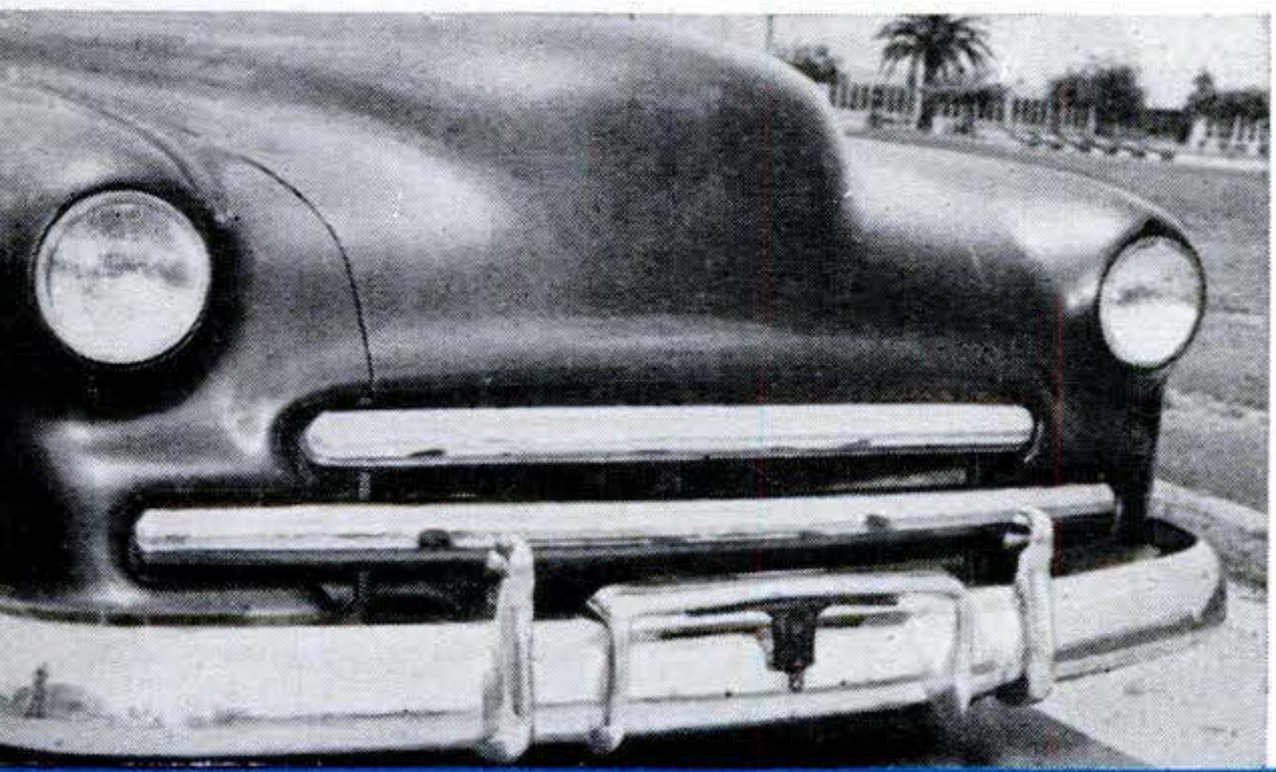
Ford

A '41 Ford coupe travels in luxury to which it was never accustomed. One of many features is one-piece body, molded from front to rear.

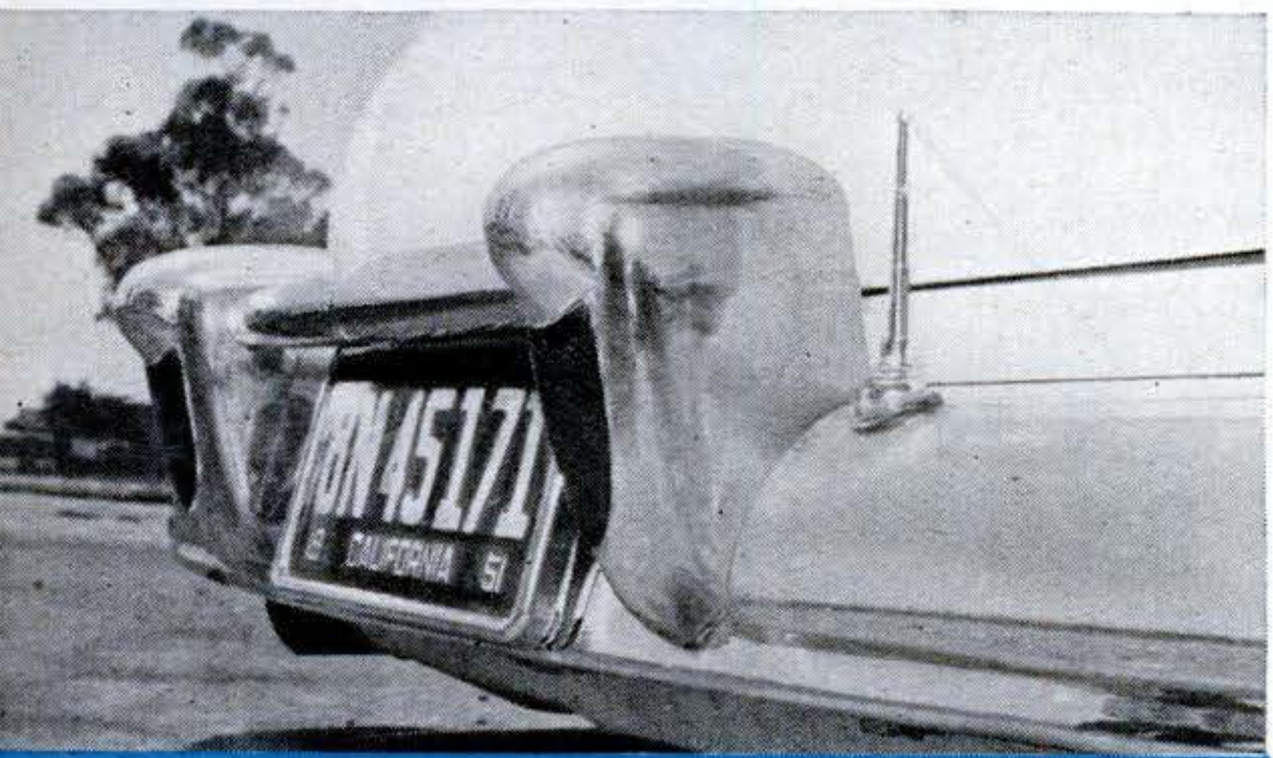
That's a '48 Cadillac grille dressing up the '41 Ford. Twin spotlights on front corner posts break up sweeping, tapered body line.

Copyrighted material

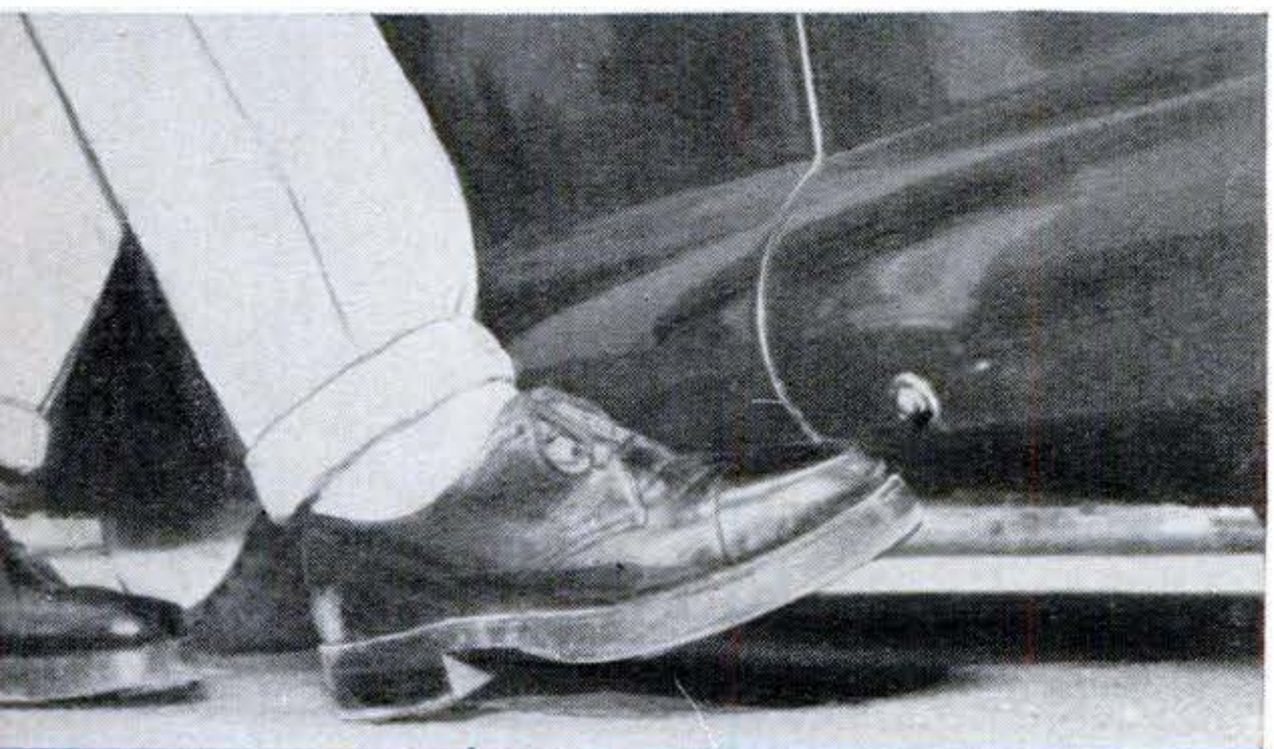
Tailored to Order



The grille is rubber-mounted in steel frame and attached to body by spring-mounted bolts. Grille may be bumped without shock to body.



Stubby radio antenna projects only four inches retracted, can be extended to 12 inches. Lucite tail lights are formed into bumper guards.



The driver gets into his car "no hands." He simply touches a button with the toe of his shoe, and an electric motor opens the door.

When the Barris brothers redesign a car to look like what it isn't, they add luxury lines and gadgets galore.

By Andrew R. Boone

TAKE a good look at the photos at the left and you'll see why car identification might become a guessing game along Southern California highways. When a Mercury body on a Ford frame powered by an Olds Rocket engine zips past, even the experts are likely to give it a double-take.

What is it?

It's a Barris car.

The brothers Barris, George, 24, and Sam, 25, perform their auto alchemy in a shop at Lynwood, a suburb of Los Angeles. If you were to pay them a visit, you'd find a small garage jammed to the walls with cars in all stages of repair, from a wrecked and burned Ford to a gleaming Cadillac receiving its final gloss. You might recognize the battered Ford, but the chances are good that you'd never know the Cad. The brothers pride themselves, when turning out what they call a Barris Kustom Car, in creating a design so individual in appearance that even its original maker wouldn't recognize their re-creation.

Business Born in High School

It started 10 years ago when the two brothers, then students at San Juan High School in Sacramento, became dissatisfied with the lines of their knockabout Ford coupe. Laboring after school and week ends, they changed its body into something that sent their pals into a rave of teen-talk superlatives. That decided them to turn their hobby into a business.

The next decade was a busy one for George and Sam. During those 10 years they have:

- Restyled more than 1,000 cars, each different from all the others.
- Made both removable tops and removable windows in a variety of styles.
- Devised push-button mechanisms for

Copyrighted material

Here's how customized '49 Mercury shown on preceding page compares with a stock model of the same vintage. Reworked job is lower, narrower. Body clears road by only three inches.

Teamwork does it. While George Barris works on a cutaway drawing for the undercarriage of a sports-car conversion, brother Sam stands by figuring out best way to do the shop work.

Unusual combination is discussed in conference with customers. '50 Mercury body on '50 Ford frame is what they want. An Oldsmobile Rocket engine will power the sleek speedster.

electrically opening hoods, doors, windows and trunk compartments.

- Built novel and handsome floating grilles.
- Produced flowing, ground-hugging designs that have become the trade-mark of their design and workmanship from coast to coast.

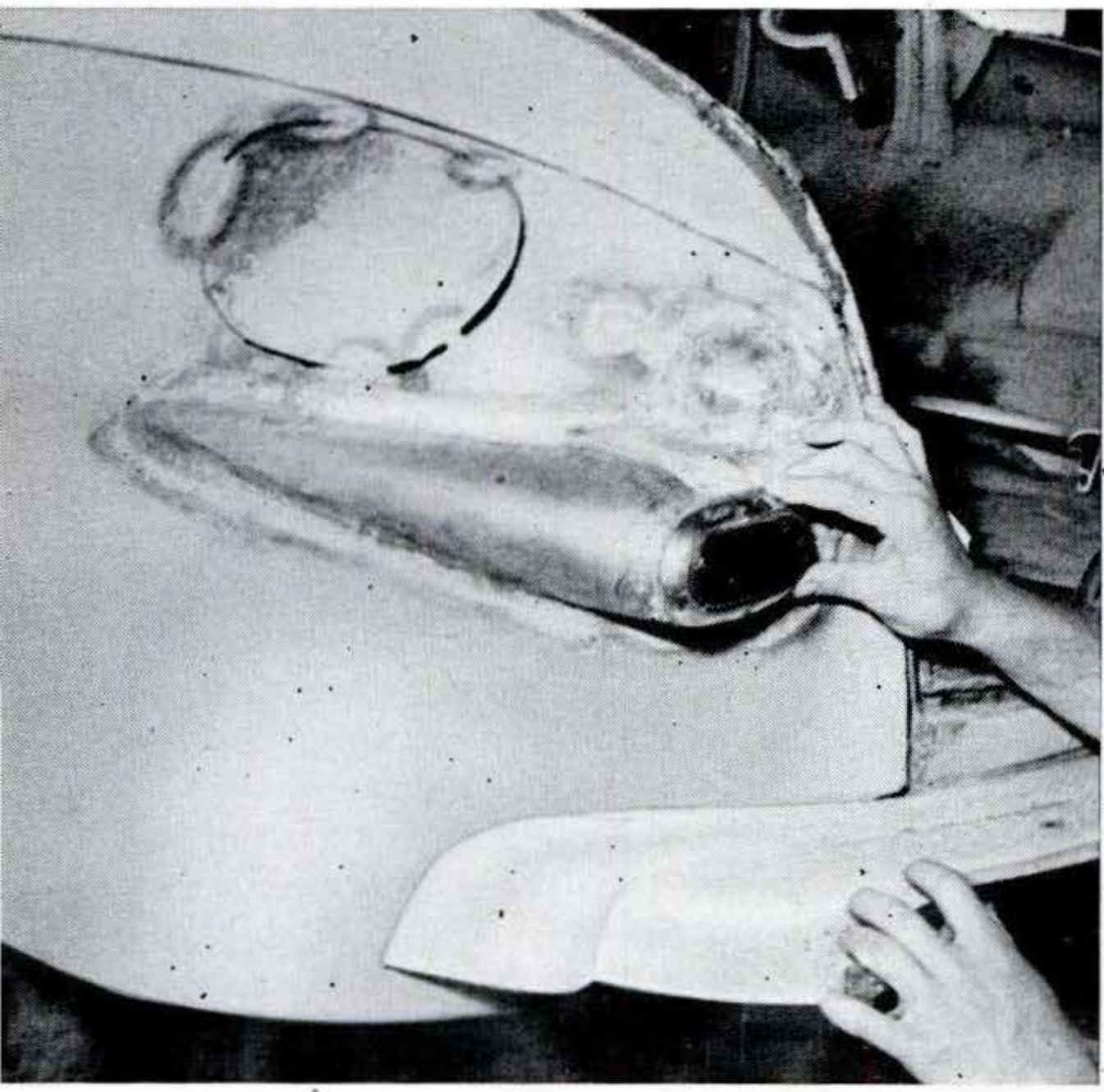
A Barris job may start with any heap of junk—perhaps little more than a chassis, engine, drive and gears. Their work begins not with metal forming but with drawings. That's George's department. High-school training in art and mechanical drawing and a facility for expressing design ideas quickly enable him to put on paper both pictures of the completed car and cutaway drawings of individual sections. The owner learns in a jiffy whether he will like George's proposal.

Most important ingredients in their prize-winning creations are design originality and workmanship. More than 50 trophies, awarded at auto shows for design, style, beauty and workmanship, attest their skill

Copyrighted material

A conversion job gets the works. This '41 Buick convertible has been lowered 14 inches. Cadillac fenders, lengthened four inches, have been raised on body to give road clearance.

George molds and leads newly created panels for grille and sealed headlights, using a hickory paddle that he slides gently across soft lead kept warm with a blowtorch.



Glass is installed in a tail light that has been welded onto side of rear fender. Extension was formed out of same kind of cold-rolled steel that is used for body building.

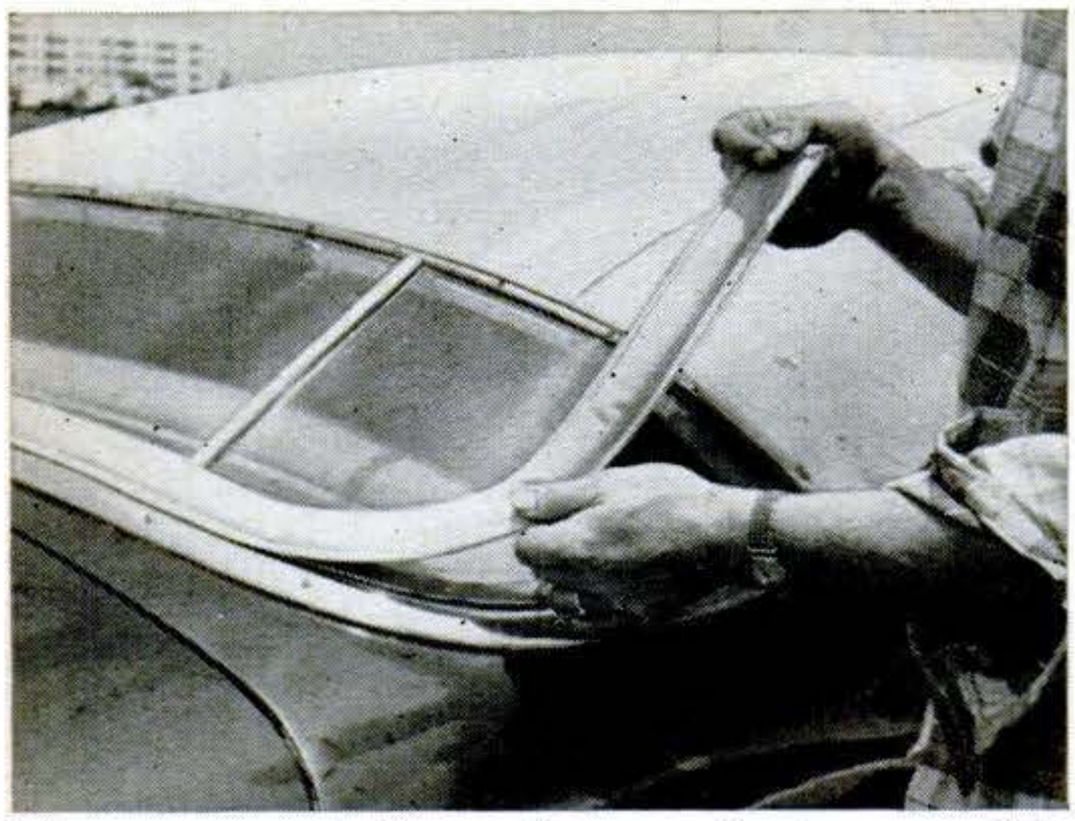
Bare metal must be really clean or paint won't stick. Here Sam uses coarse-tooth file. He'll follow with rotary grinder. Then come sanding, priming, painting, glazing, waxing.

and ingenuity. And there's no great secret to their success.

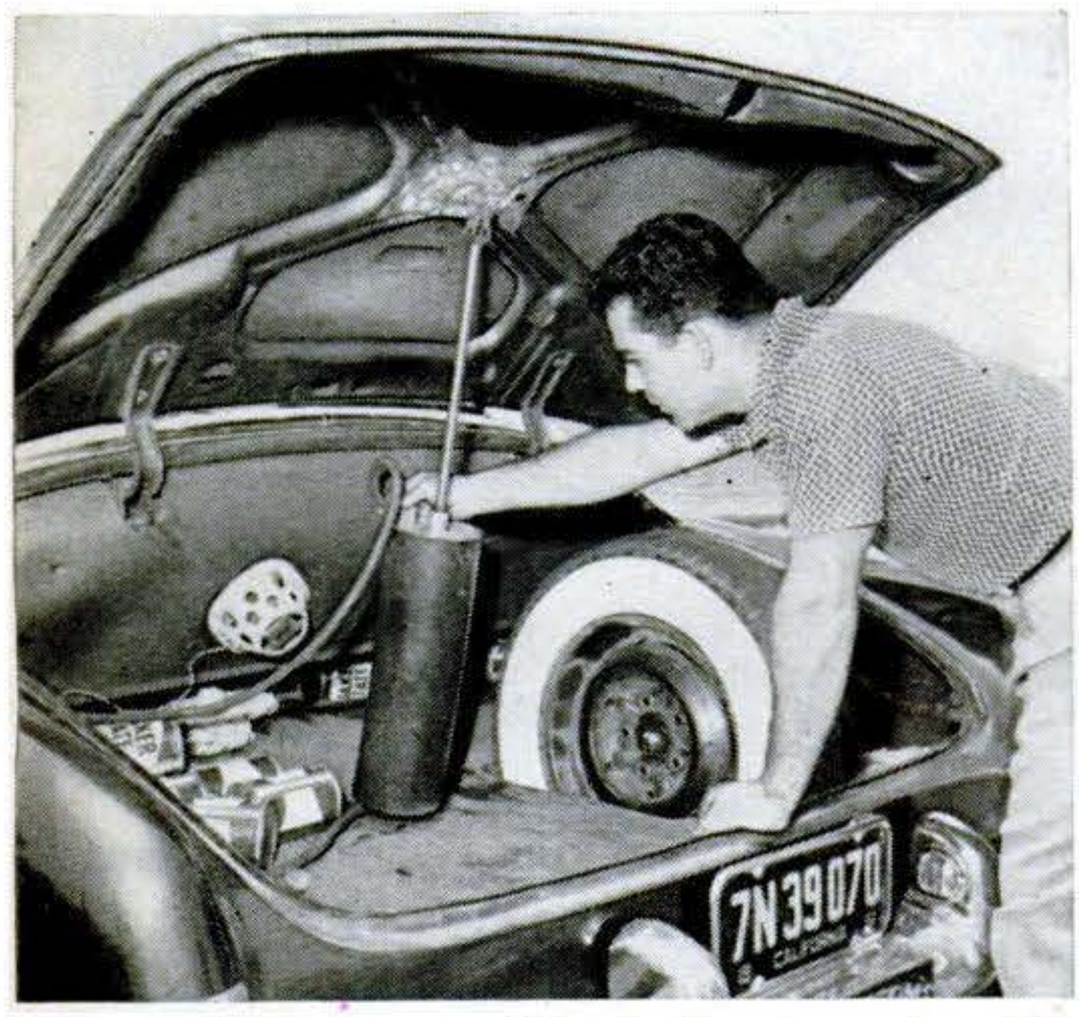
"Make 'em look good and keep 'em close to the ground," is the Barris formula. Neither George nor Sam goes along with the goop-and-gingerbread school. You'll see no foxtails and very little chrome on their cars. No pipes extend from Barris recreations, and radio antennas are all but hidden in a bumper or body. Seldom does a handle appear on the doors. The driver pushes a button, and electricity or the vacuum system takes over. Sometimes there's a luxury and hot-rod combination, like a '41 Ford convertible with a racing engine. It gets up to 93 m.p.h. in a quarter mile from a dead stop.

"Channel and drop" is a by-phrase in their busy shop. Customers, mostly among the younger set, want both novelty and low lines. The top may be lowered, body narrowed, fenders lengthened, wheelbase shortened. Even on a minor, superficial changeover, the brothers make certain that some

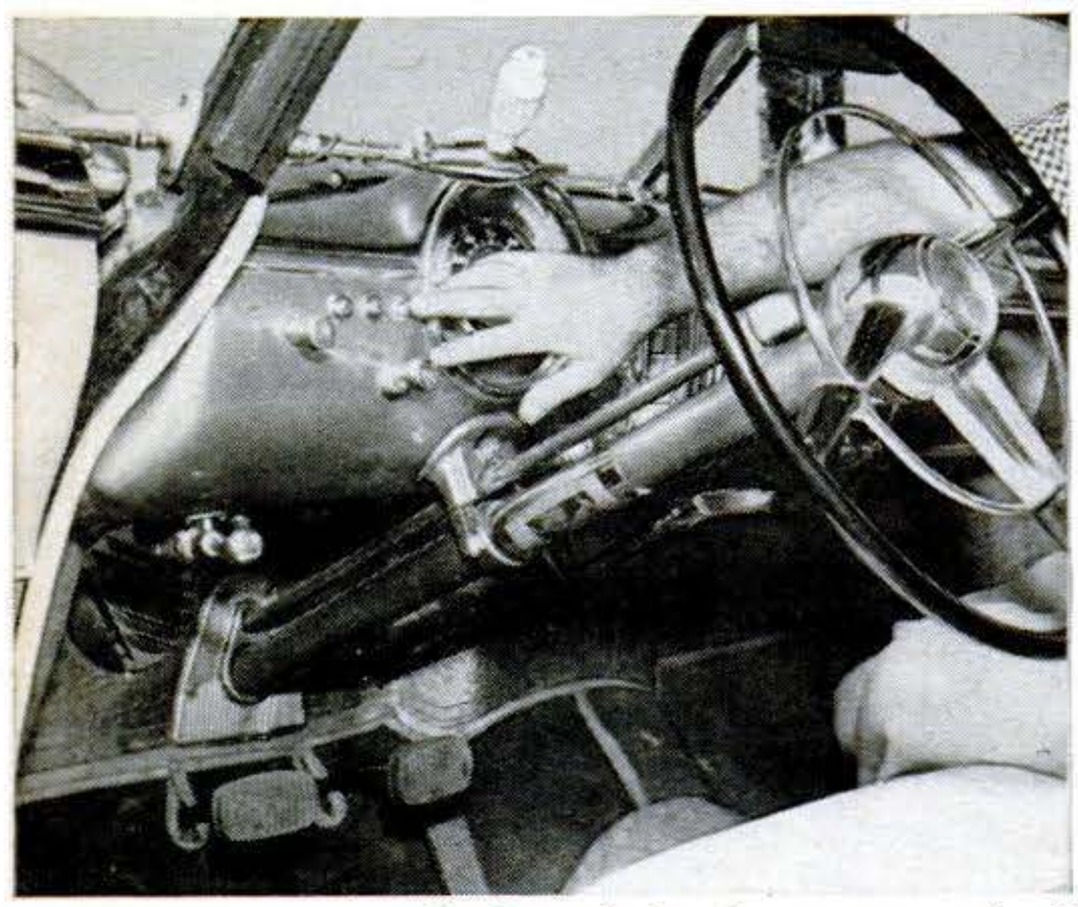
Copyrighted material



Three rear windows of customized convertible are easily taken out by unsnapping a padded strip, as above. On some jobs windows are part of the top, but can be unscrewed for removal.



This cylinder once lifted the top of a '41 Chevvie convertible. Now it raises the trunk lid of a converted '49 Chevvie. It operates off vacuum manifold through a three-way switch.



Push buttons on dash at left of steering wheel operate pneumatic controls that automatically open doors, raise hood and open trunk cover. On some jobs, controls are hydraulic.

feature differs from those found on all other cars. It may be no more than a streamlined tail-light bracket.

On a major redesign, Sam strips the car down to its skeleton. New fenders are formed. Altered components are rewelded. Sam cuts down or builds new doors, painstakingly fitting them. George fairs in adjoining metal with lead. Sam reams out all holes, fills them with braze metal, shrinks the plugs in tightly, files all spots for painting.

Together, Sam and George finish the interior. A chrome-and-red-plastic dash goes into a Chevvie coupe; two-toned upholstery, piped and rolled, into a Merc convertible. Painting comes last, but this is by no means the least part of their efforts. Guide coat, sanding, two coats of sealer, 25 paint coats (each block sanded), frequent rubbing, final glazing and waxing.

Show Cars Must Shine

It all adds up in cost, but both George and Sam insist upon plenty of paint. Many of these beauties are entered in shows. Only an adequate protective body can withstand the repeated polishing that grooms a car to prize-winning luster.

As the idea man, George prides himself on a hatful of new wrinkles. He sported curb feelers on his first car, 10 years ago. Soon he began slanting tops downward toward the rear to achieve sweeping lines. But too much sweep can become monotonous. So he adds twin spotlights on front corner posts to get a two-step appearance. On many cars he removes the drain-mold system, relying upon tight door fits to keep the water out.

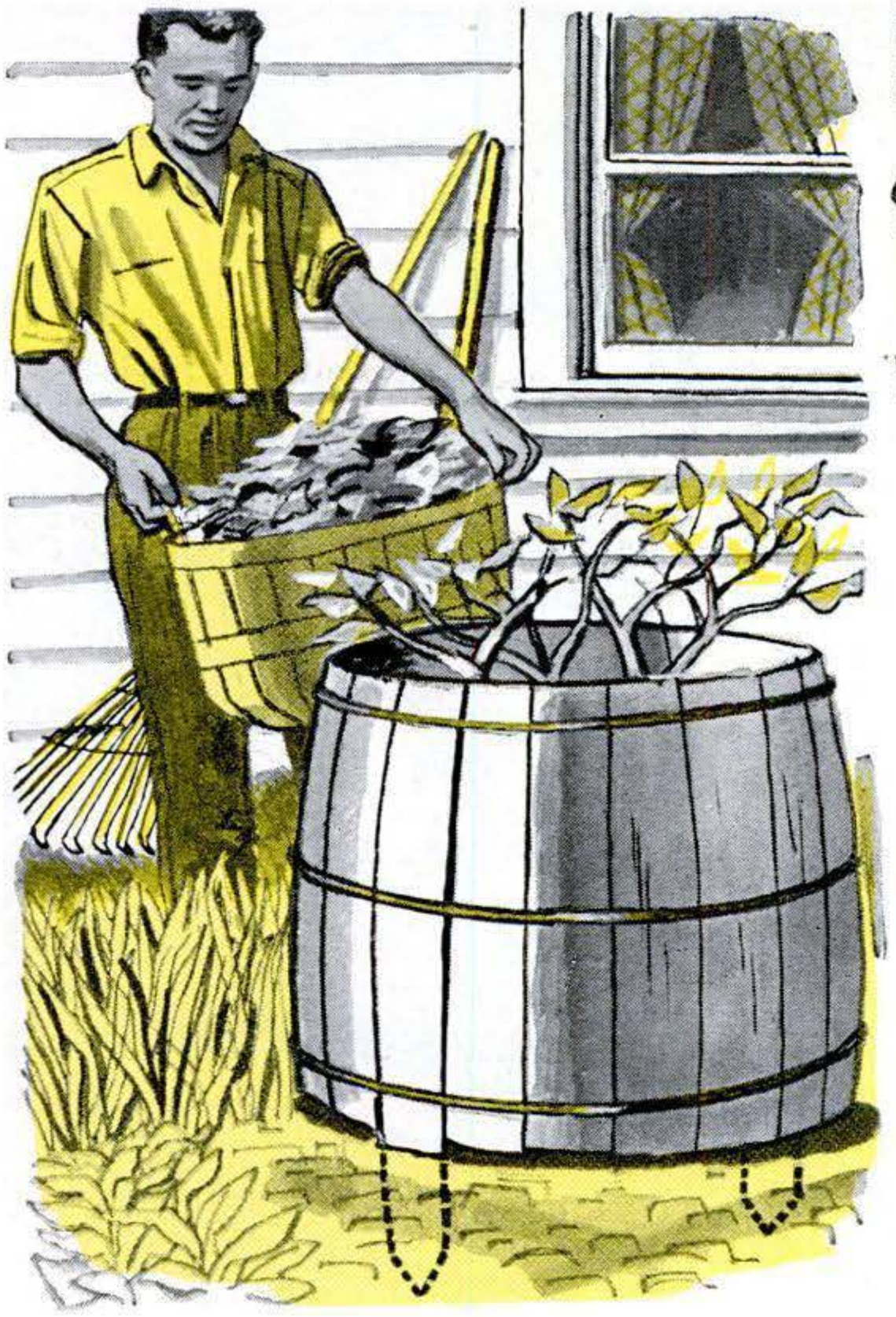
Buick Has Built-in Bar

He's especially proud of a converted '49 Buick. A complete cocktail bar slides out from the rear seat at the touch of a button. The boys plan a superdooper Cadillac. Today it stands in an out-of-the-way garage, gutted by fire. Refurbished, the Cad will carry all-pneumatic controls, a rear-seat bar, a television set recessed in the front seat and a pair of wheels on stilts that can be lowered to raise the low-slung rear body over sharp dips in the highway.

As new ideas come along, George will sketch them, Sam will execute them. That's the way these designer-builders already have achieved success in a business that demands lots of talent and enterprise. END

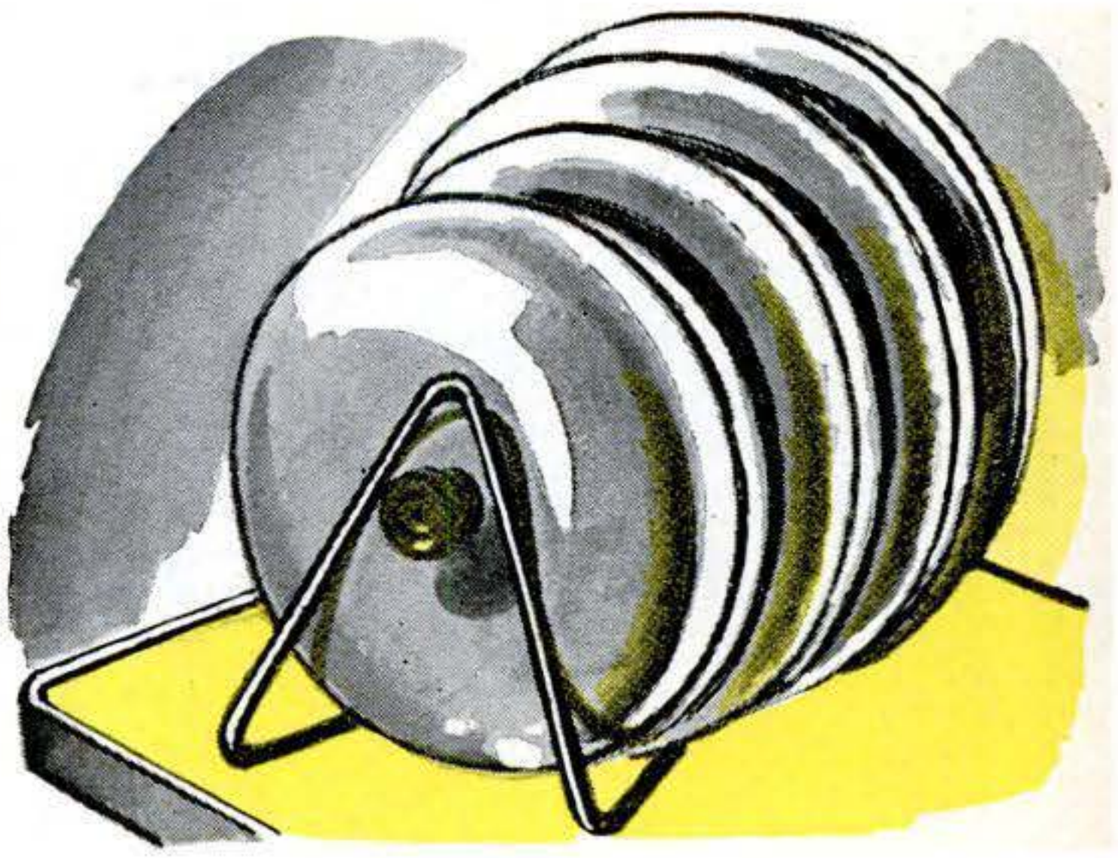
Copyrighted material

Keeping the Home Shipshape



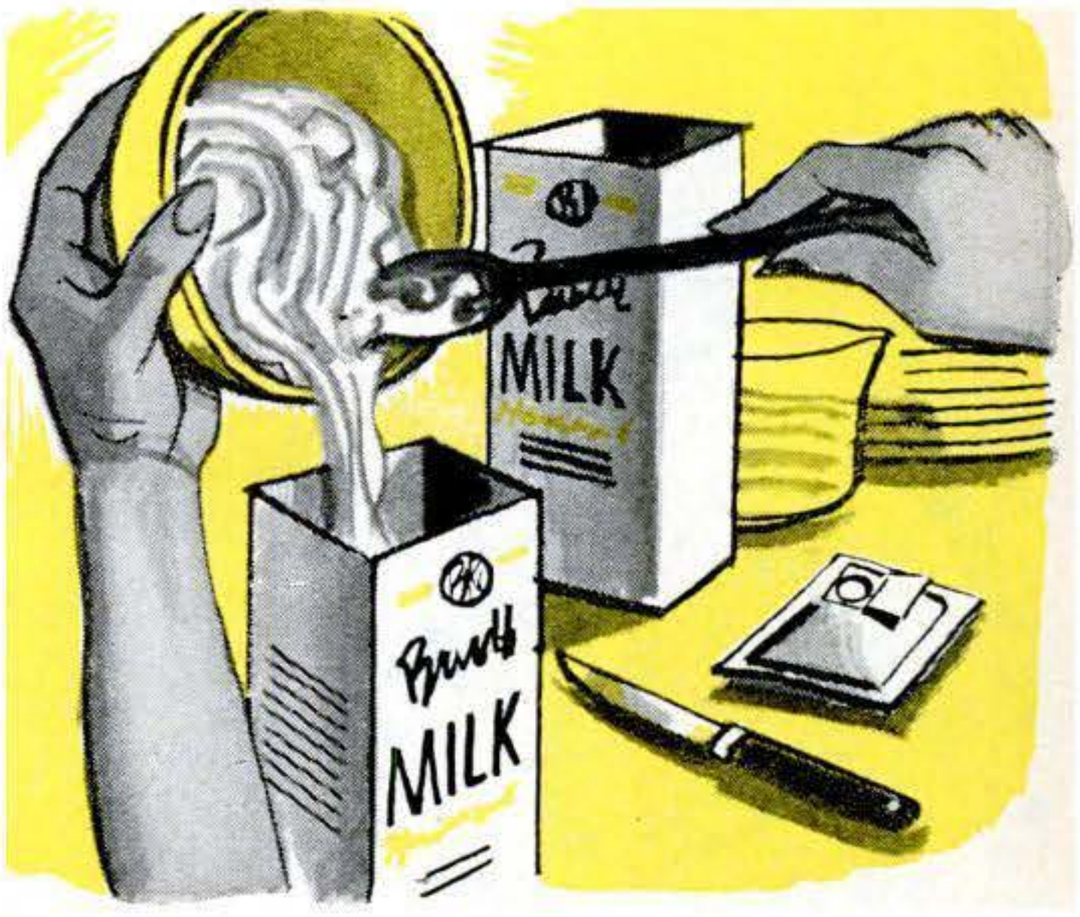
Nail kegs will protect small shrubs from winter frost damage. Saw off the lower third, but leave two opposite staves full length. Point these so that they can be embedded in the ground.

Use a clean oil can to feed liquid medicines to a pet. Squirt the medication into the back of pet's mouth, if open; or squirt it in at the side if you can't open the jaws.



Pot lids stack neatly and conveniently in a wire napkin rack. Stand it ready at hand on a counter top or mount it on a sliding board in a kitchen cabinet.

You won't have to stoop so far to pick up sweepings if you make a simple change in the handle of your dustpan brush. Cut it off, then replace at an angle as above.

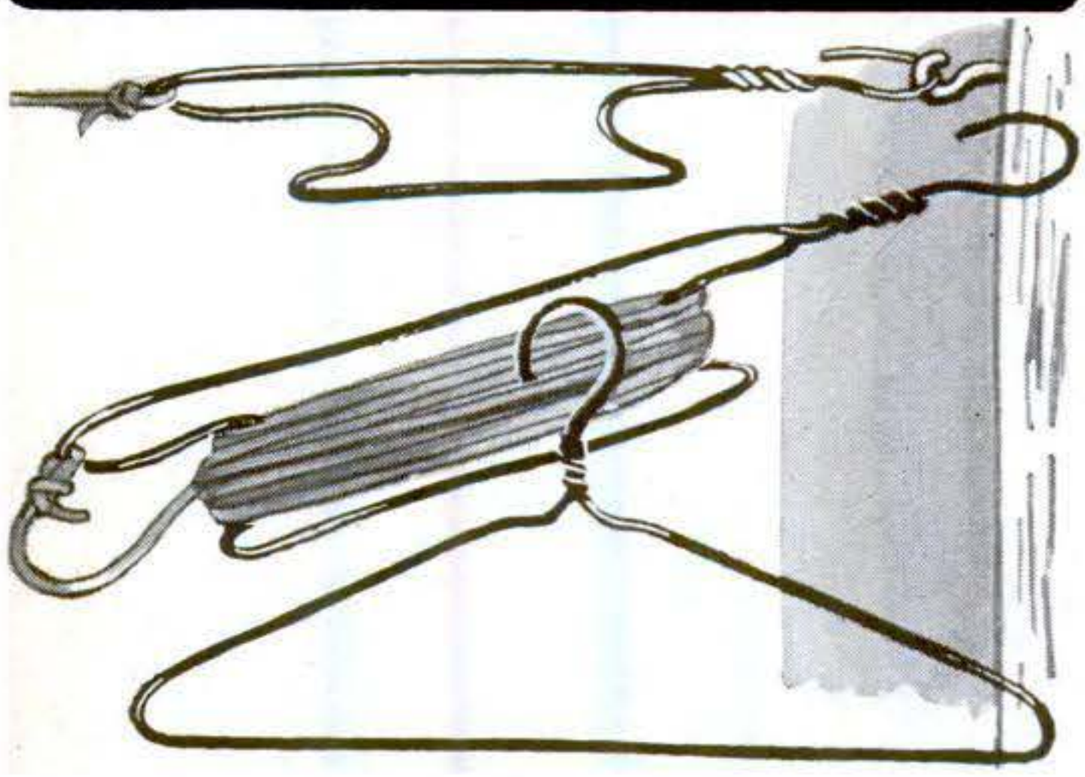


If you have a home freezer, save empty milk cartons. They're fine containers for freezing all kinds of foods. Slice off the top so that it can be replaced and sealed with tape.

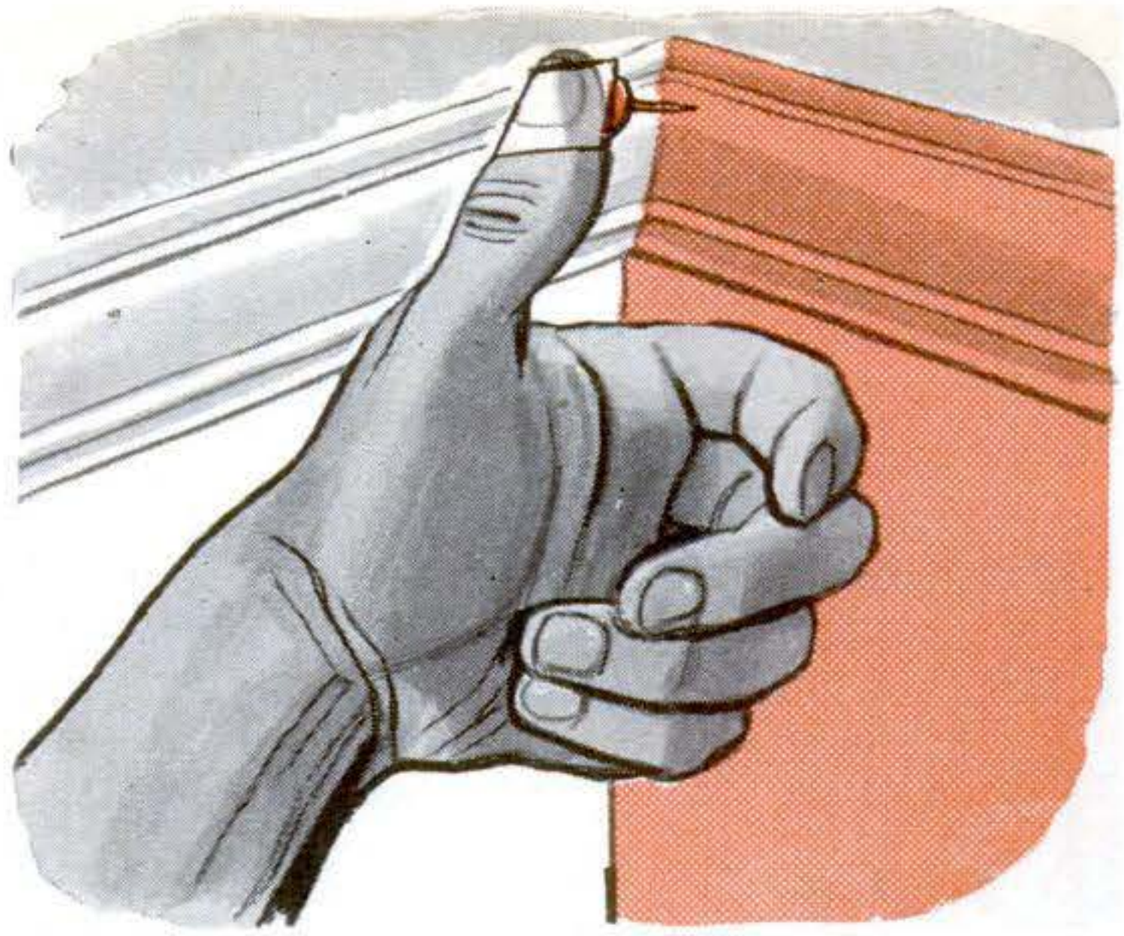
Please turn the page for five more suggestions.

Copyrighted material

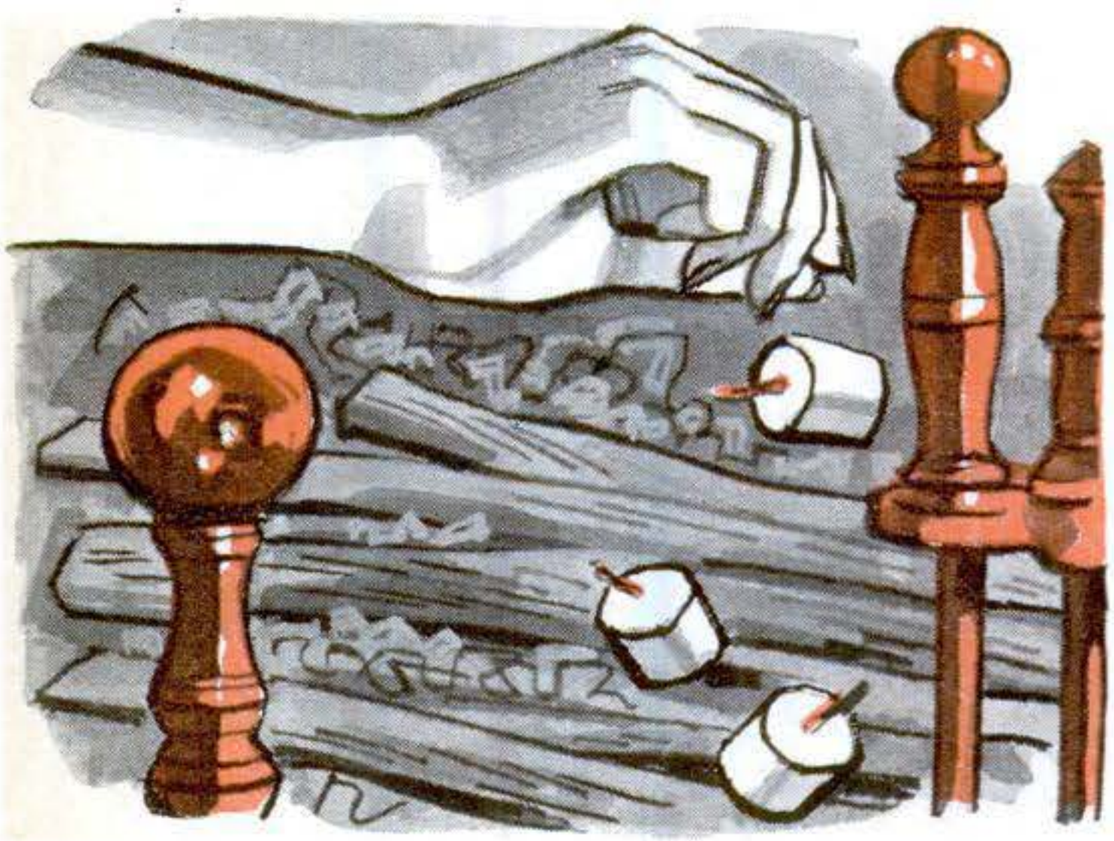
Keeping the Home Shipshape



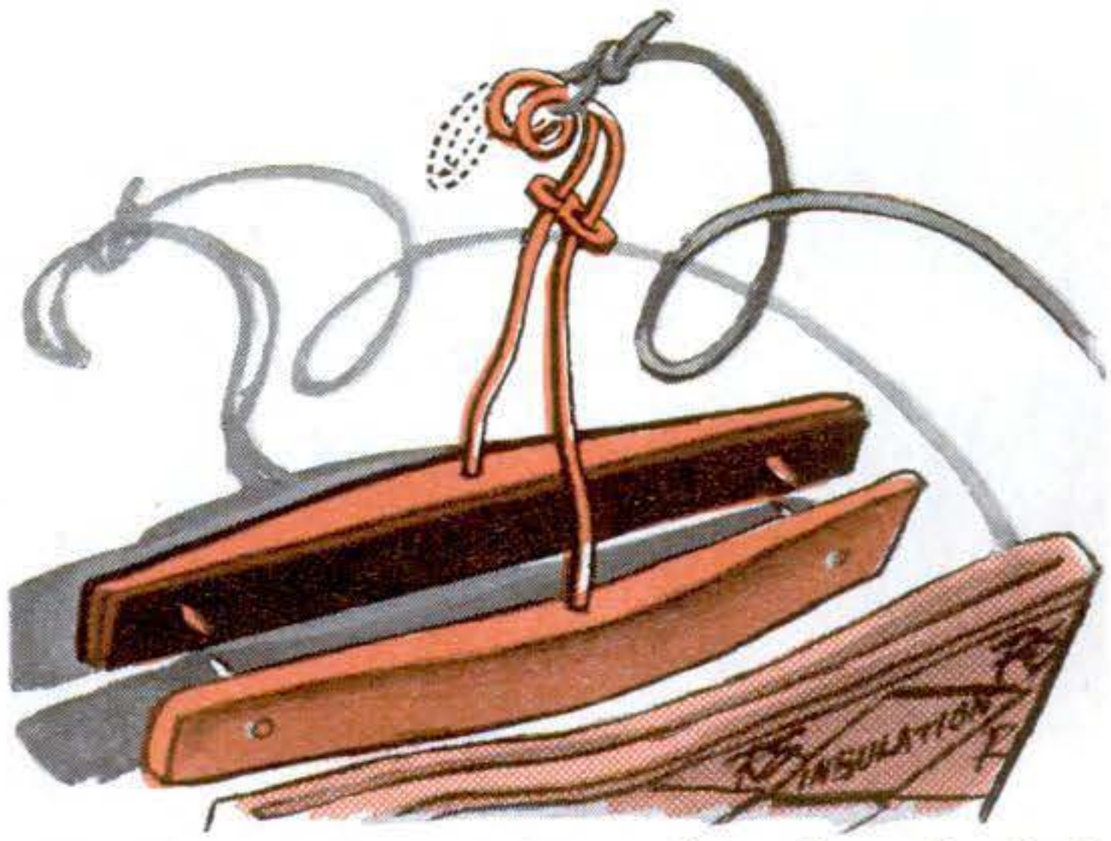
A clothesline reel that's handy for light laundry can be made by bending a heavy-wire hanger. Put a hook on the opposite end of the line to eliminate tying and untying.



When hanging party decorations, you can push tacks into corners where your hand won't fit if you wrap tape around your thumb, sticky side out. Tack heads will cling to the tape.



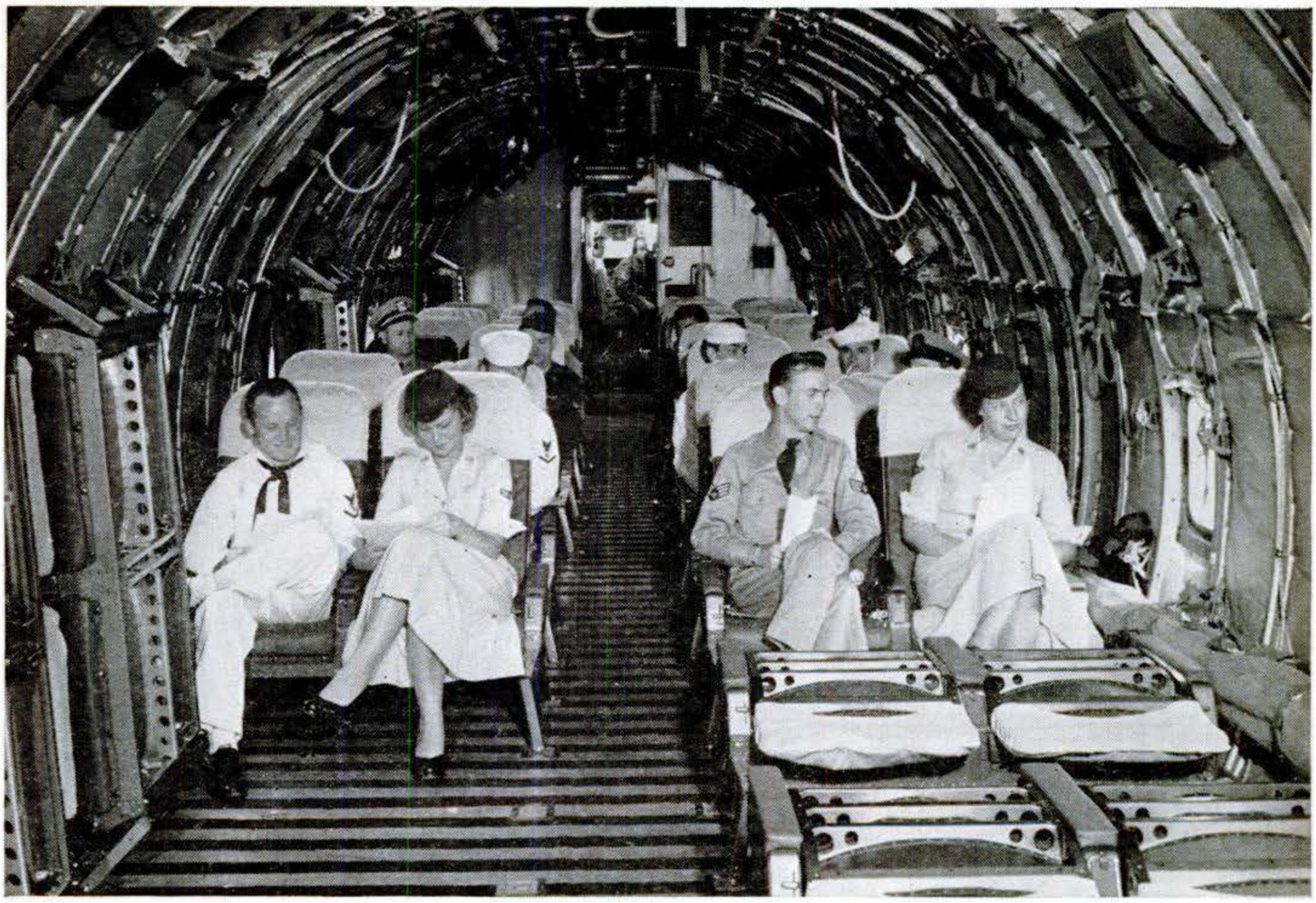
Old candle ends thrown in the fireplace or furnace will make it easier to start your fire. Paper and kindling will ignite the wax, which will help wood or coal catch fire faster.



To fish insulation batts through a finished wall, try using a trouser hanger as your hook. You can make it grip tightly by driving two brads through each side of the hanger.

Heavy plastic place mats make attractive and long-lasting splash guards for use behind kitchen and bathroom sinks. Attach them to the wall with cement or decorative tacks.

Copyrighted material

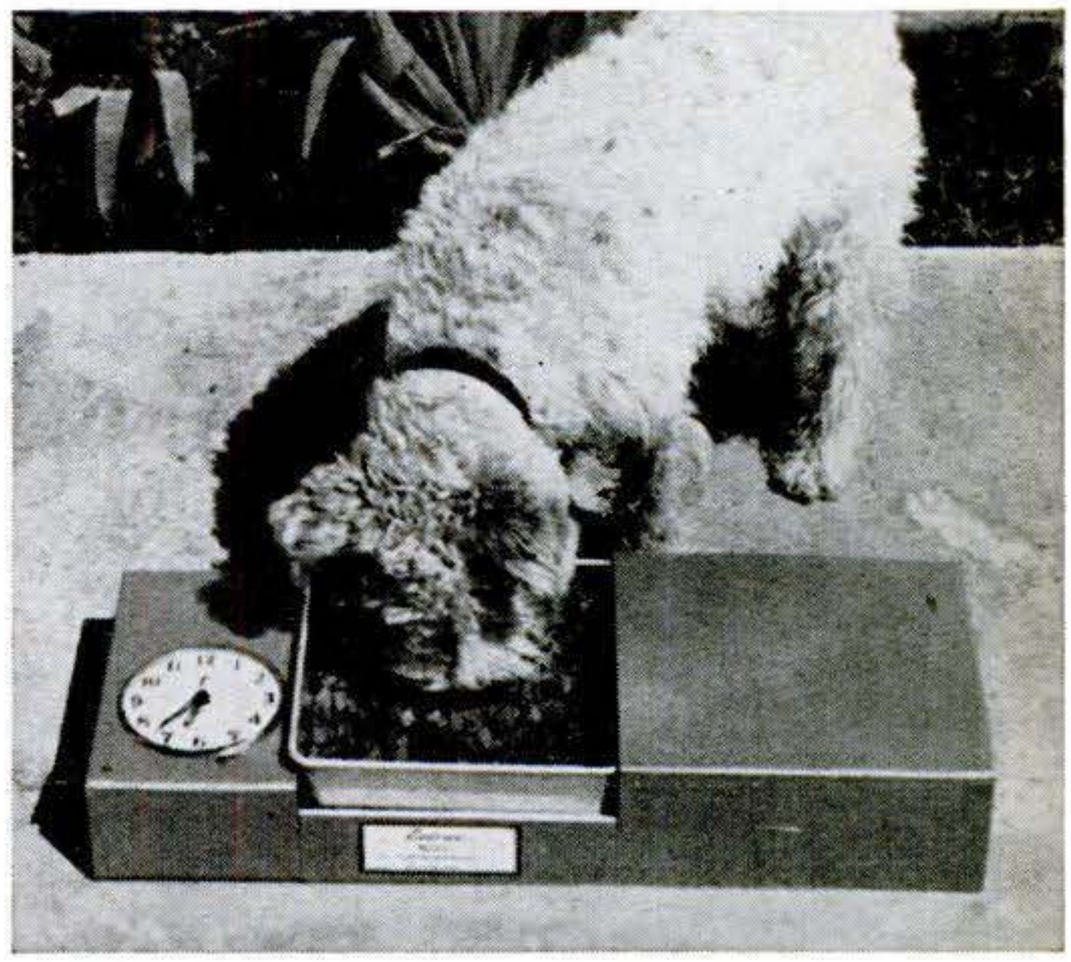


Airplane Seats Face Rear

THE front of this Boeing C-97 transport is *behind* the passengers, who face the tail of the plane. Rear-facing seats, long favored by safety experts because they provide extra support for head, shoulders and body in the event of a crash, have now been adopted by the Military Air Transport Service for all its new planes. When the seats aren't in use, they can be folded flat, as in right foreground, and then against the cabin walls so that the space may be used for cargo.

Biggest Prism Weighs 300 Lb.

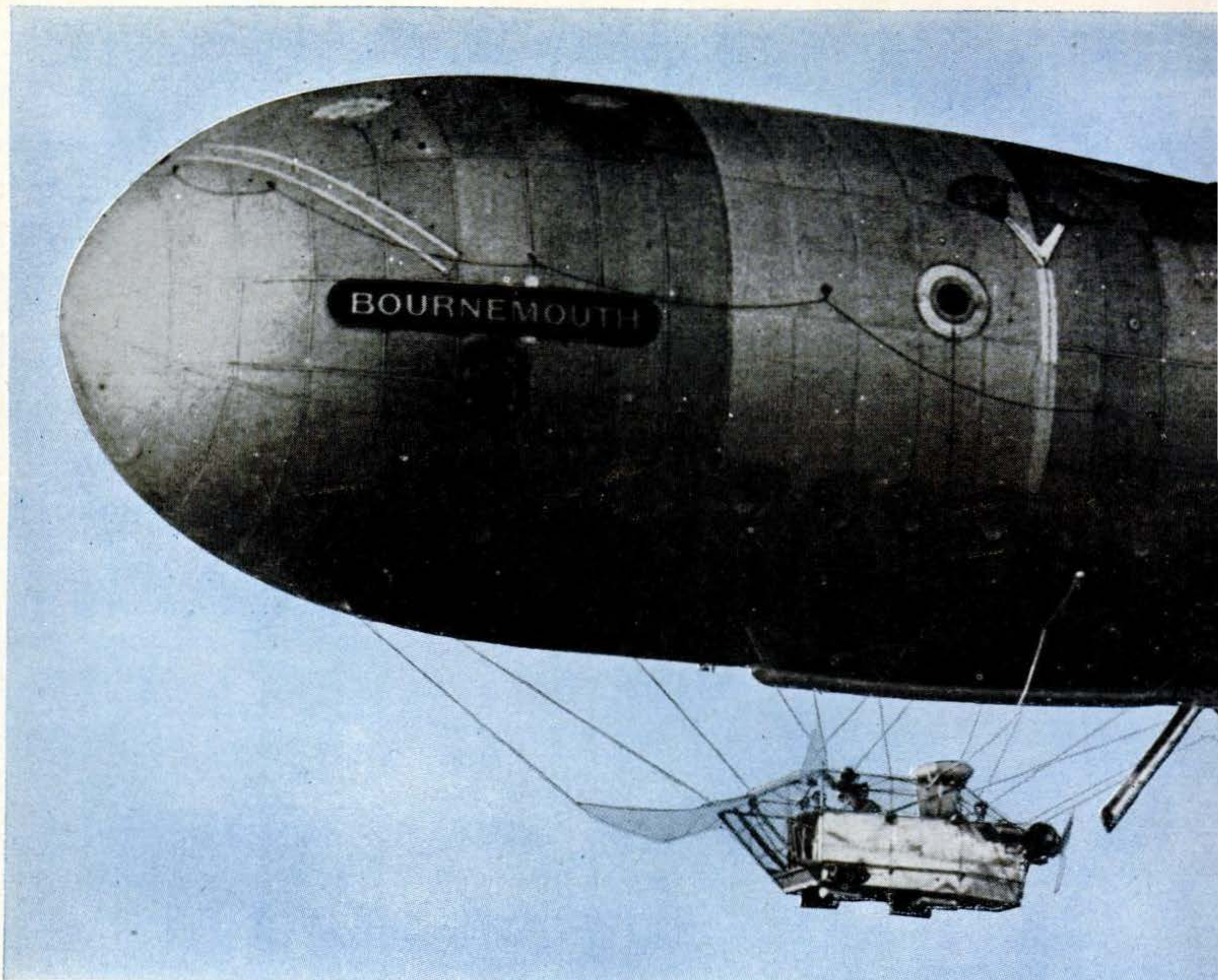
THIS 300-pound piece of glass, said to be the world's largest prism, is 33 inches across. Its two faces were ground within two-millionths inch of perfect flatness by the Perkin-Elmer Corp. for a telescope at the Harvard Observatory in South Africa.

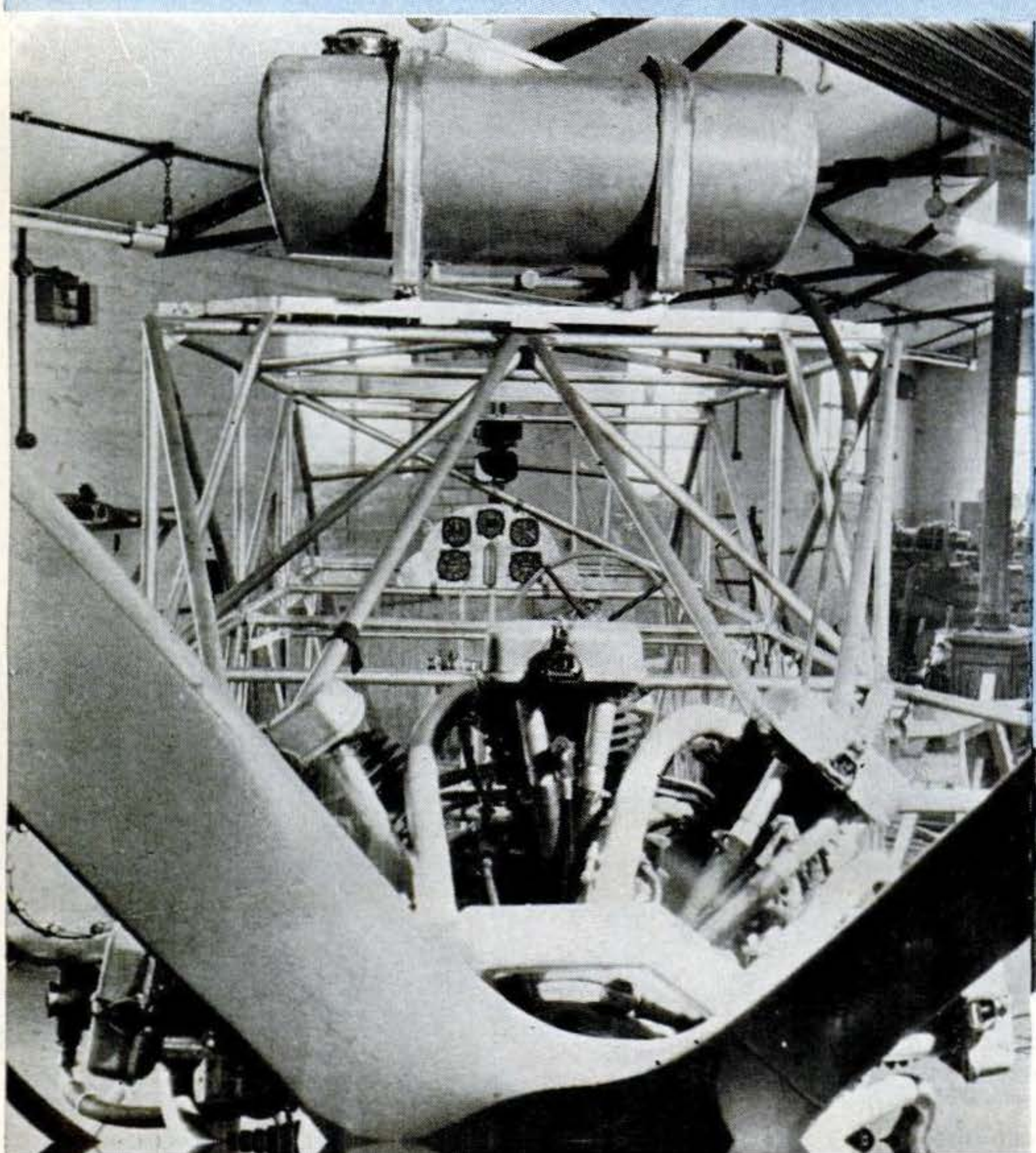


Clock Feeds the Dog

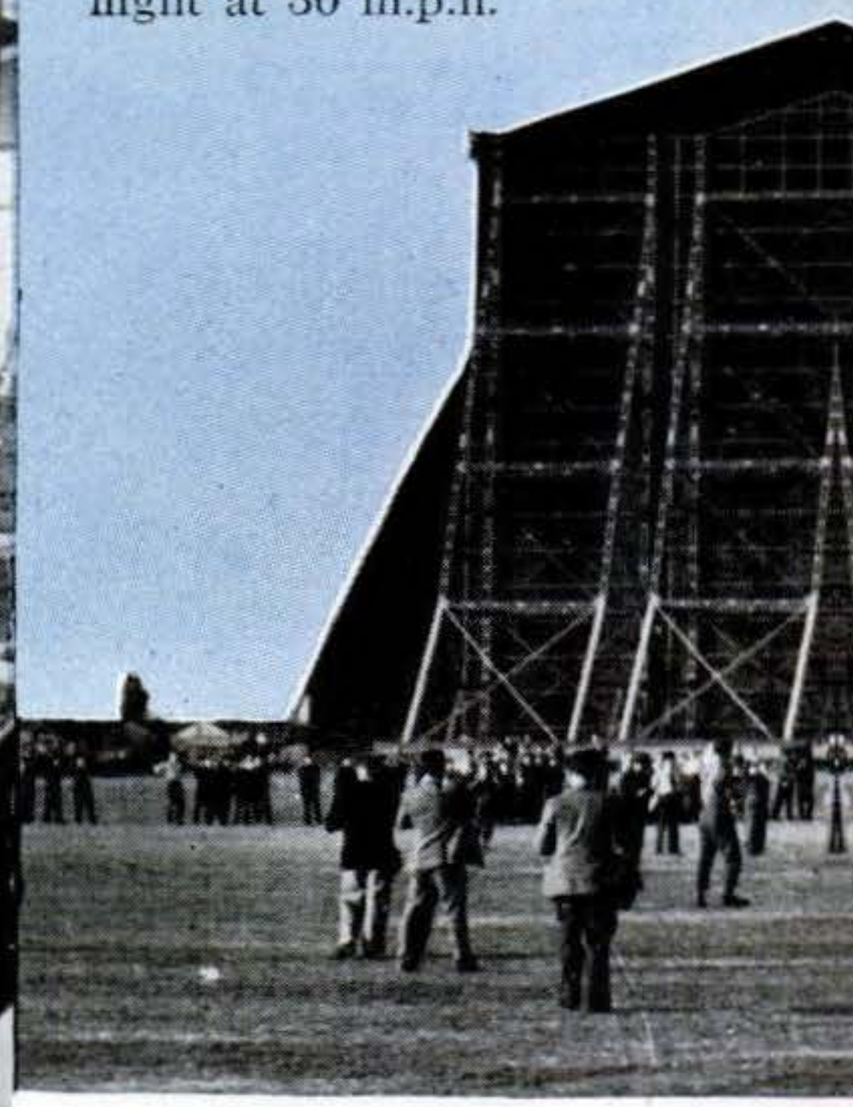
SET the clock in the feeder above, and when chow time arrives the food pan slides out of covered section at right—ready for hungry Fido. To make sure he knows dinner's on, a bell rings at the same time. It's made by Evernu Products, San Francisco.

Copyrighted material

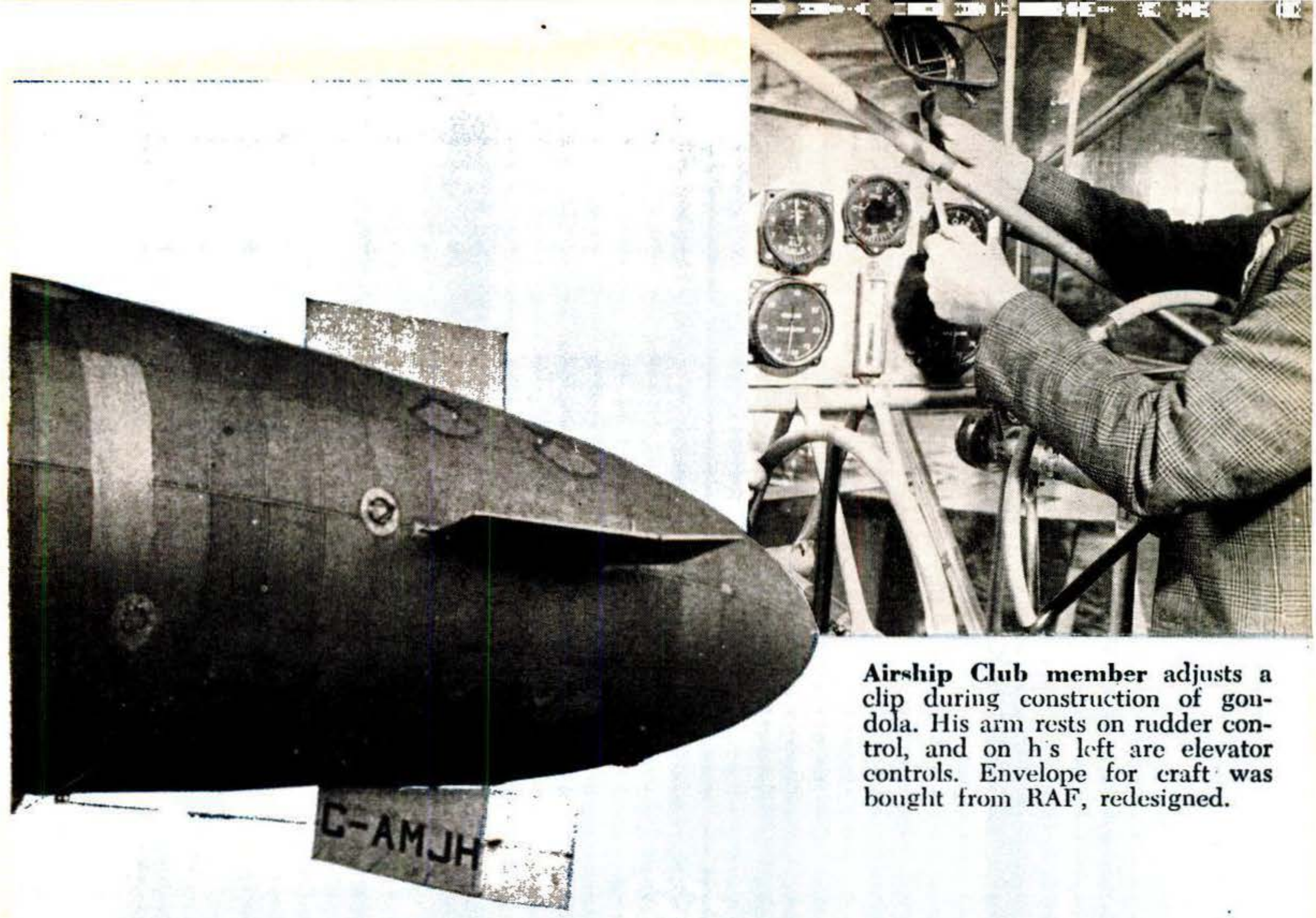




Boxlike construction of four-place aluminum-alloy gondola is shown at left. Gas tank holds 29 gal., enough for 10-hour flight at 30 m.p.h.



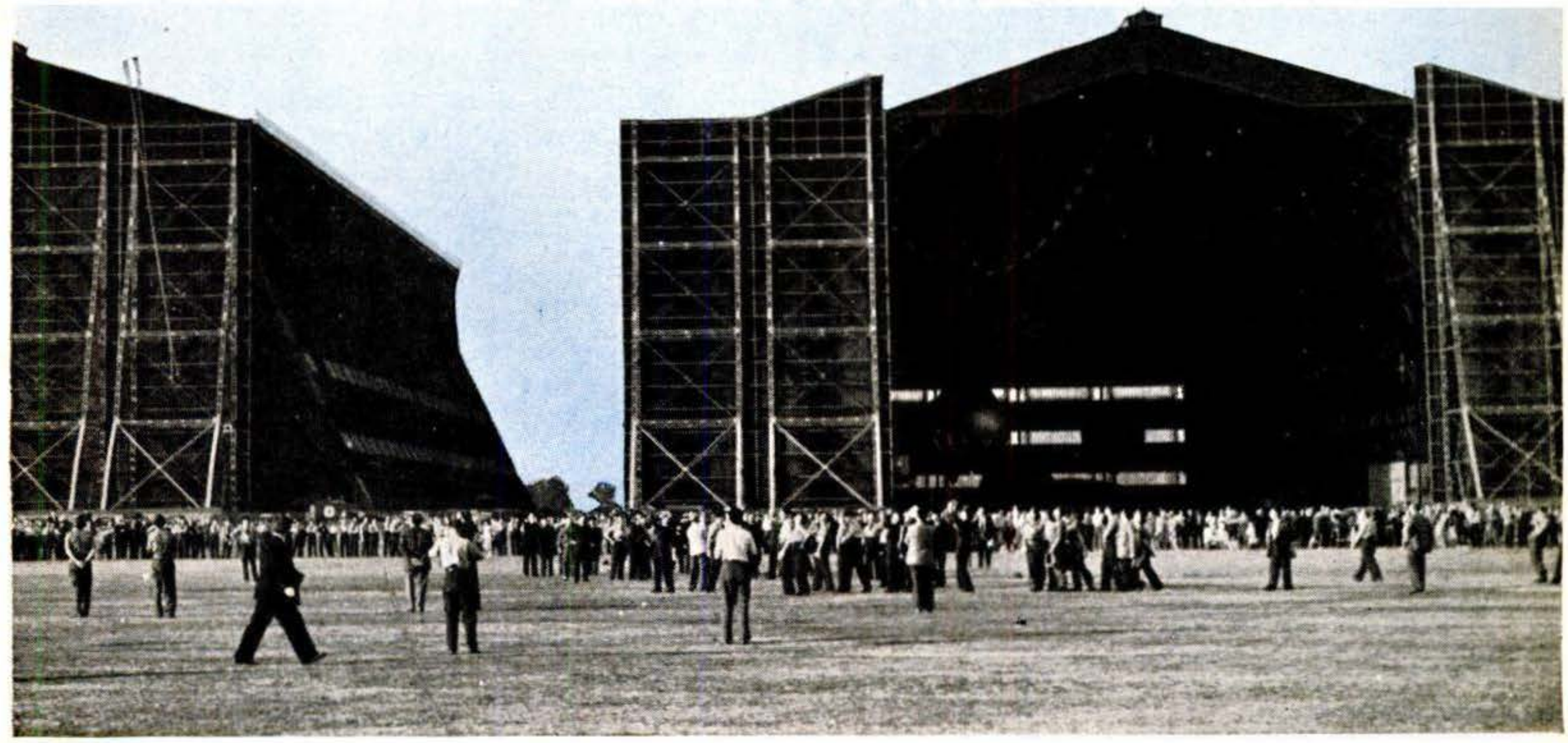
Copyrighted material



Airship Club member adjusts a clip during construction of gondola. His arm rests on rudder control, and on his left are elevator controls. Envelope for craft was bought from RAF, redesigned.

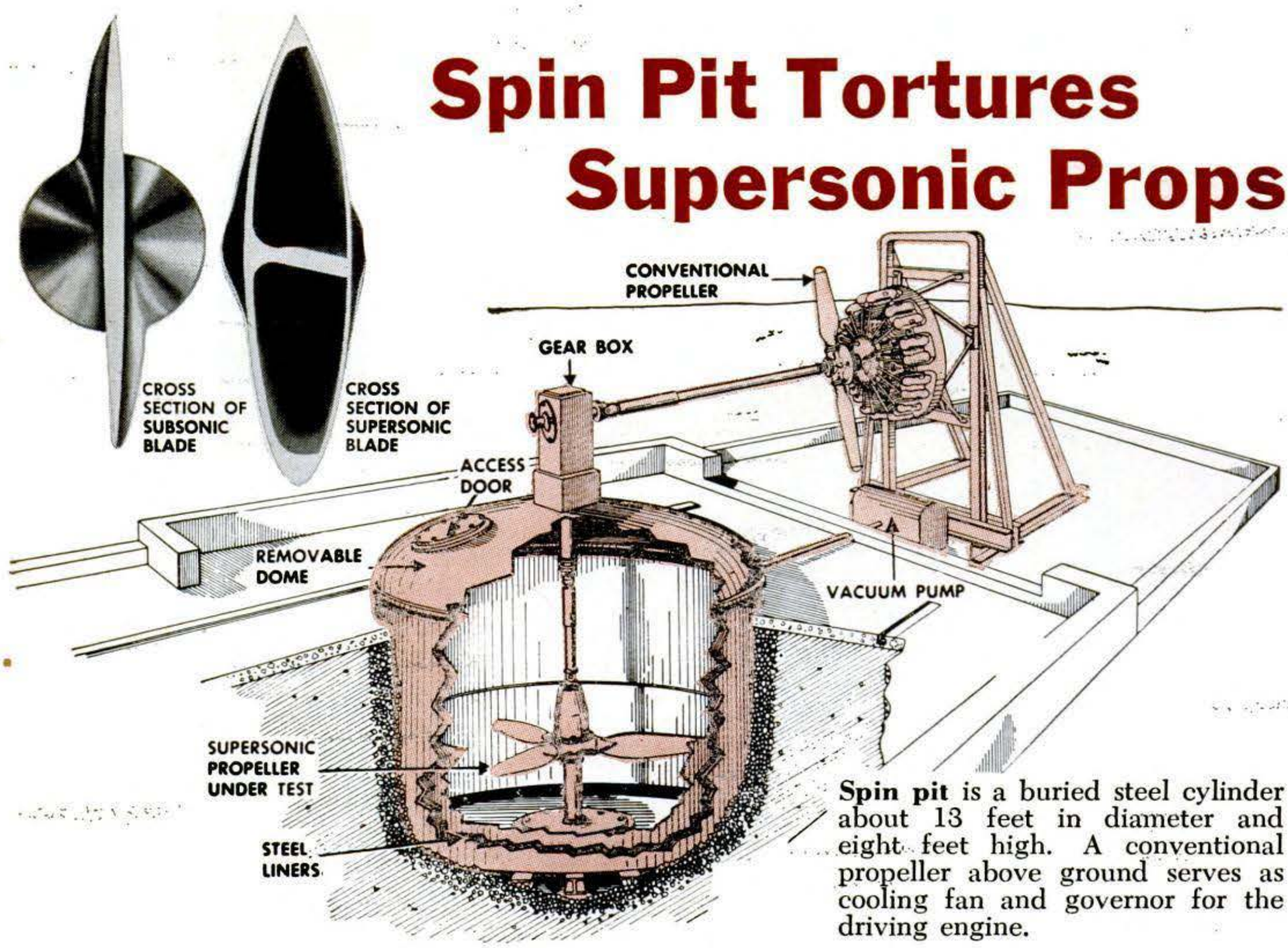
They Built a Blimp for Fun

THE 250 members of the Airship Club of Great Britain designed and built this blimp, the Bournemouth, with $7,000 of their own money. It's the first such airship to be made in England since the crash of the R101 in 1930. The nonrigid bag is 108 feet long, 27 feet in diameter and holds 45,000 cubic feet of hydrogen. A 75-hp. engine drives its propeller, and it does 45 m.p.h. Shortly after these pictures were taken, a tow rope caught on a building and the gas bag was torn, but no one was hurt.



Copyrighted material

Spin Pit Tortures Supersonic Props

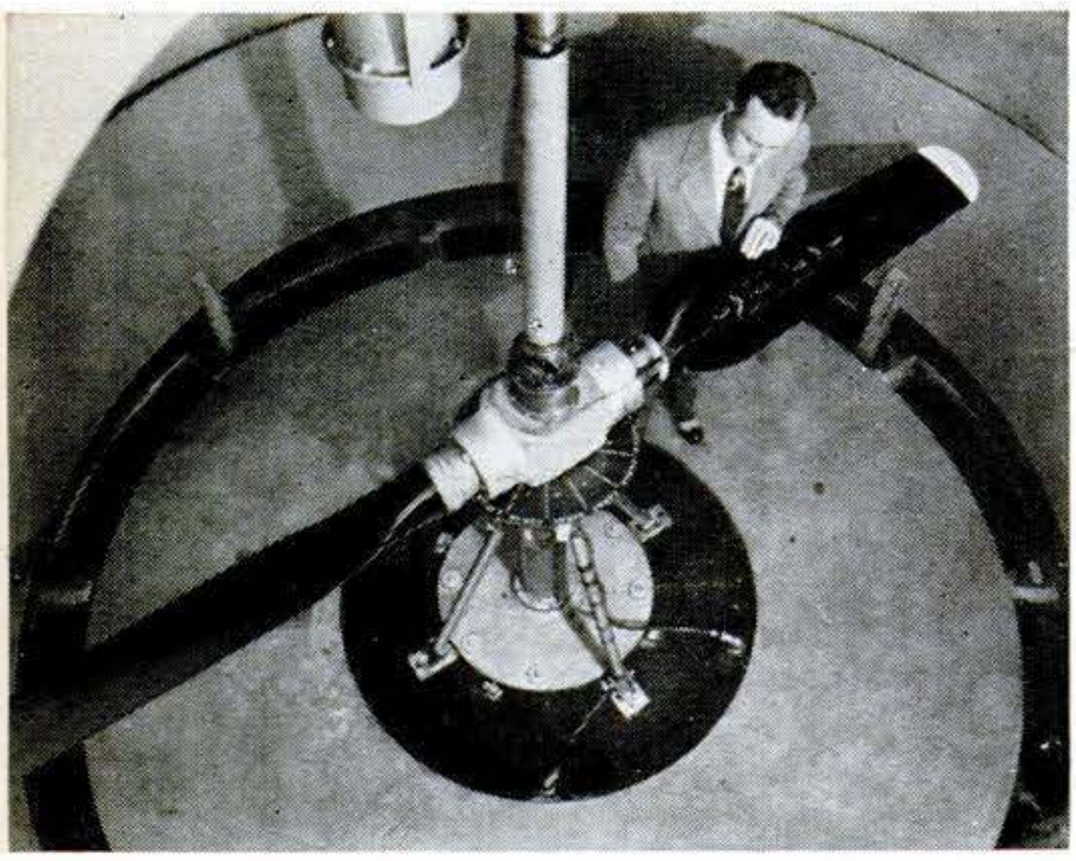


Spin pit is a buried steel cylinder about 13 feet in diameter and eight feet high. A conventional propeller above ground serves as cooling fan and governor for the driving engine.

BURIED in the ground at Dayton, Ohio, is a new kind of laboratory—one that tests propellers designed to fly planes faster than the speed of sound.

The world's first supersonic-propeller spin pit has just been put in operation by the Aeroproducts Division of General Motors. In it, props are whirled at superspeeds to see what kind of stresses they develop. Contrary to the belief generally held a few years ago, it is now thought that propellers—as well as jet engines—can be used to drive airplanes through the speed of sound and beyond.

Built to hasten research on the shapes of such propellers, the spin pit has a vacuum pump that enables the operator to simulate various atmospheric pressures under which the propellers will operate at high altitude. And with reduced atmosphere, low horsepower can spin props at high r.p.m.



An engineer inside pit checks an electrical pickup that indicates stresses propeller is subjected to during test runs. The prop blades shown here are of conventional design.

Conduit-Box Tabs Make Washers

LARGE washers with small holes are not always easy to find. I make my own from the round metal tabs that electricians punch from conduit boxes. When I need a washer, I select a tab of the right size from my collection and drill a hole through it.—*J. C. Branstetter, San Francisco.*

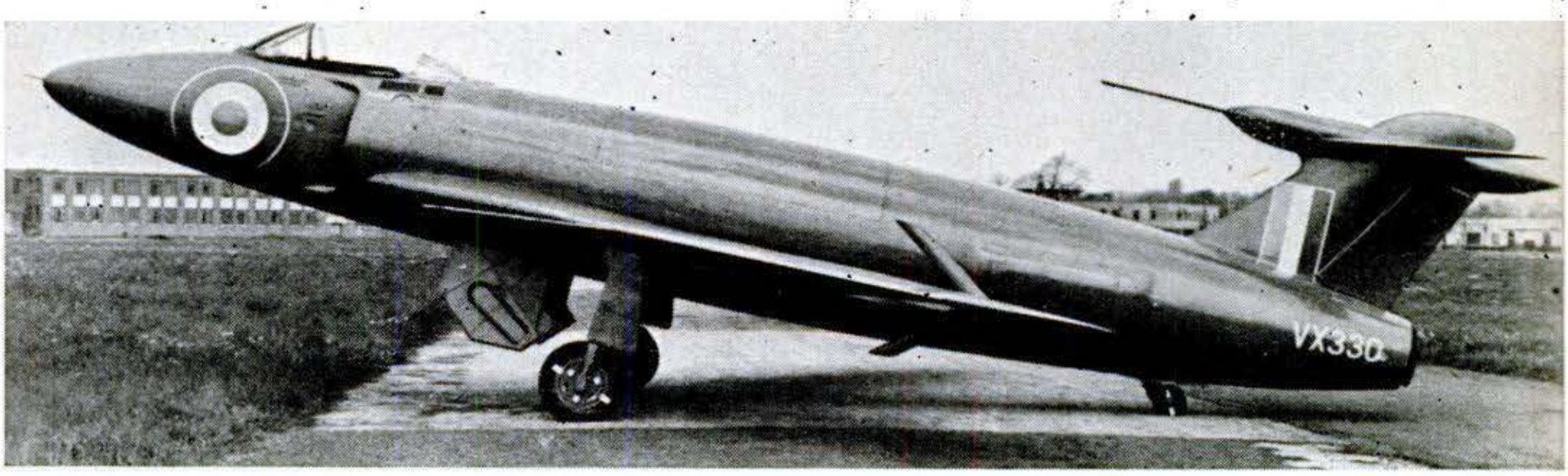
New Drug Is Stronger than Morphine

A NEW pain-killing drug, said to be more powerful and longer-acting than morphine, may help make this country independent of foreign sources of opiates. A synthetic, Dromoran, or 3-hydroxy-N-methyl-morphinan, was first produced by a German chemist, Dr. Rudolf Grewe. Closely related to morphine, it is habit-forming.

Copyrighted material

New Sprayers Walk and Crawl

THESE two extremes in new weapons for the war on bugs were demonstrated recently at an international agricultural conference in London. The donkey packs a small gasoline engine hooked to a fan that blows dust from a hopper through three flexible pipes tipped with double-barreled nozzles. The motorized sprayer at right, built on a narrow-gauge crawler tractor, has a glass-windowed cab to protect the operator from noxious mist laid down by a battery of jets in the rear. It carries 200 gallons of liquid insecticide or weed killer.



British Jet Tries New Wing

LATEST product of Britain's research in jet planes is this H.P. 88, shown after completing its first test flight. The high-speed prototype sports an experimental wing and is powered by a Rolls Royce Nene turbojet engine. It was built jointly by Handley Page and Blackburn and General Aircraft.

Sky Chef Serves Bomber Crew

THE old Air Corps was never like this. Aboard the B-36 superbomber a two-burner electric stove with built-in icebox brings some of the comforts of home to crews on 30- to 40-hour missions. Crew in forward compartment will receive hot food by means of a conveyor belt that travels through the 85-foot communications tunnel. Other features intended to increase crew effectiveness and prevent fatigue are lavatories with washbasins, hot and cold running water, and even shaving mirrors.

Copyrighted material

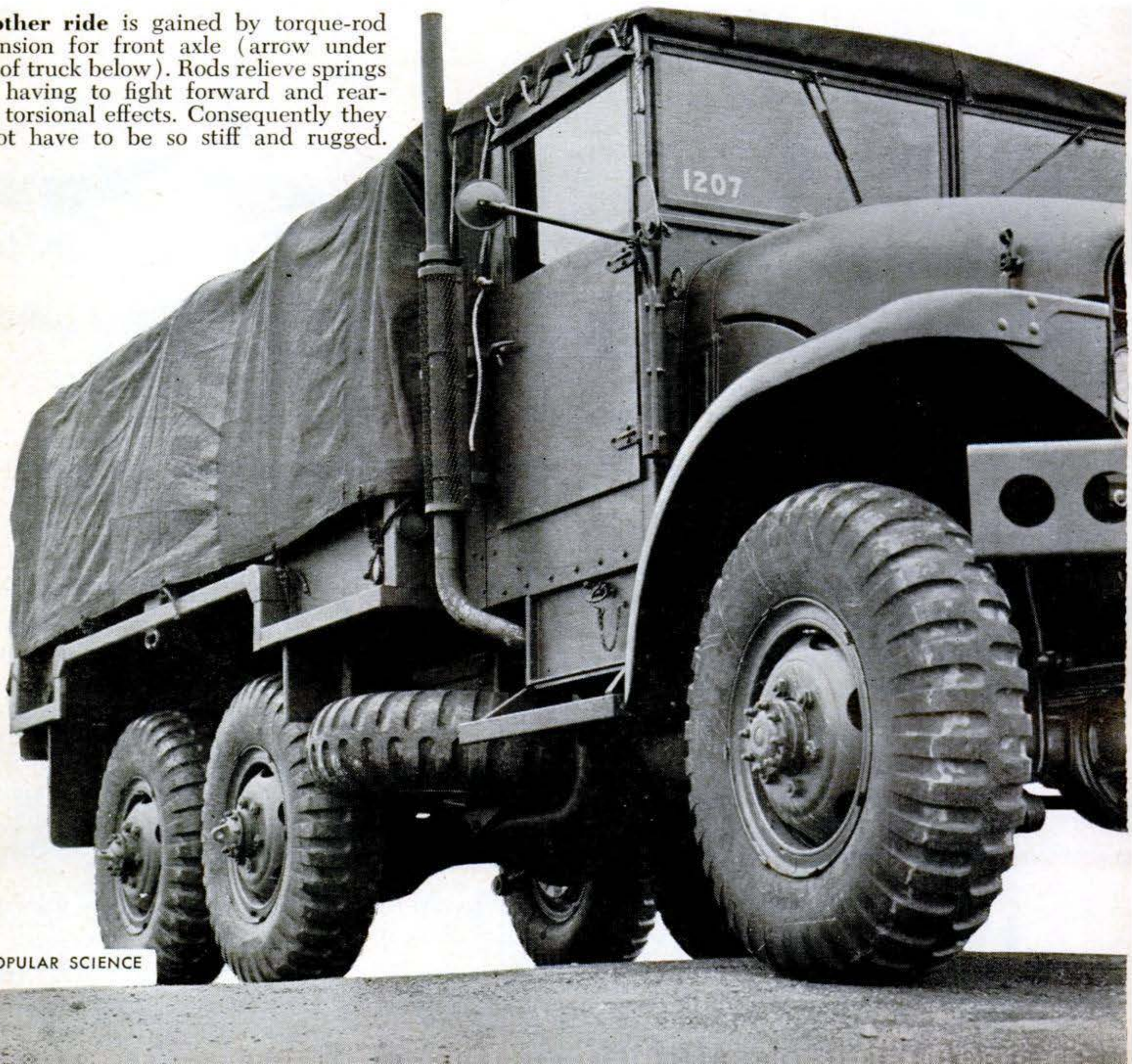
GI Truck Gets Automatic Drive

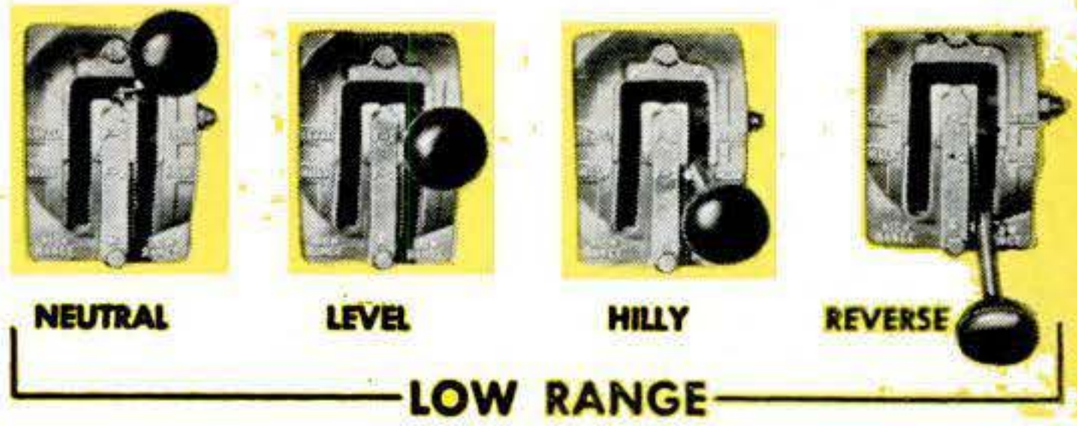
By Herbert O. Johansen

EVEN the Army's worst driver would find it hard to snafu a convoy with this six-by-six. I came to that conclusion after a preview drive in the new military super-truck over the ruts, bumps, bogs and 60-percent grade (photo at top left) of the Billy Goat course of General Motors' proving ground at Milford, Mich.

Anybody who can operate a steering wheel can run this job. Hydra-Matic transmission, with eight speeds forward and two in reverse, does the job of gear selection almost automatically even in the toughest battlefront terrain. On the highway, power goes only to the two rear axles. But when the truck suddenly hits rough ground, causing the rear wheels to lose traction, power is automatically applied to the front wheels.

Smoother ride is gained by torque-rod suspension for front axle (arrow under front of truck below). Rods relieve springs from having to fight forward and rearward torsional effects. Consequently they do not have to be so stiff and rugged.





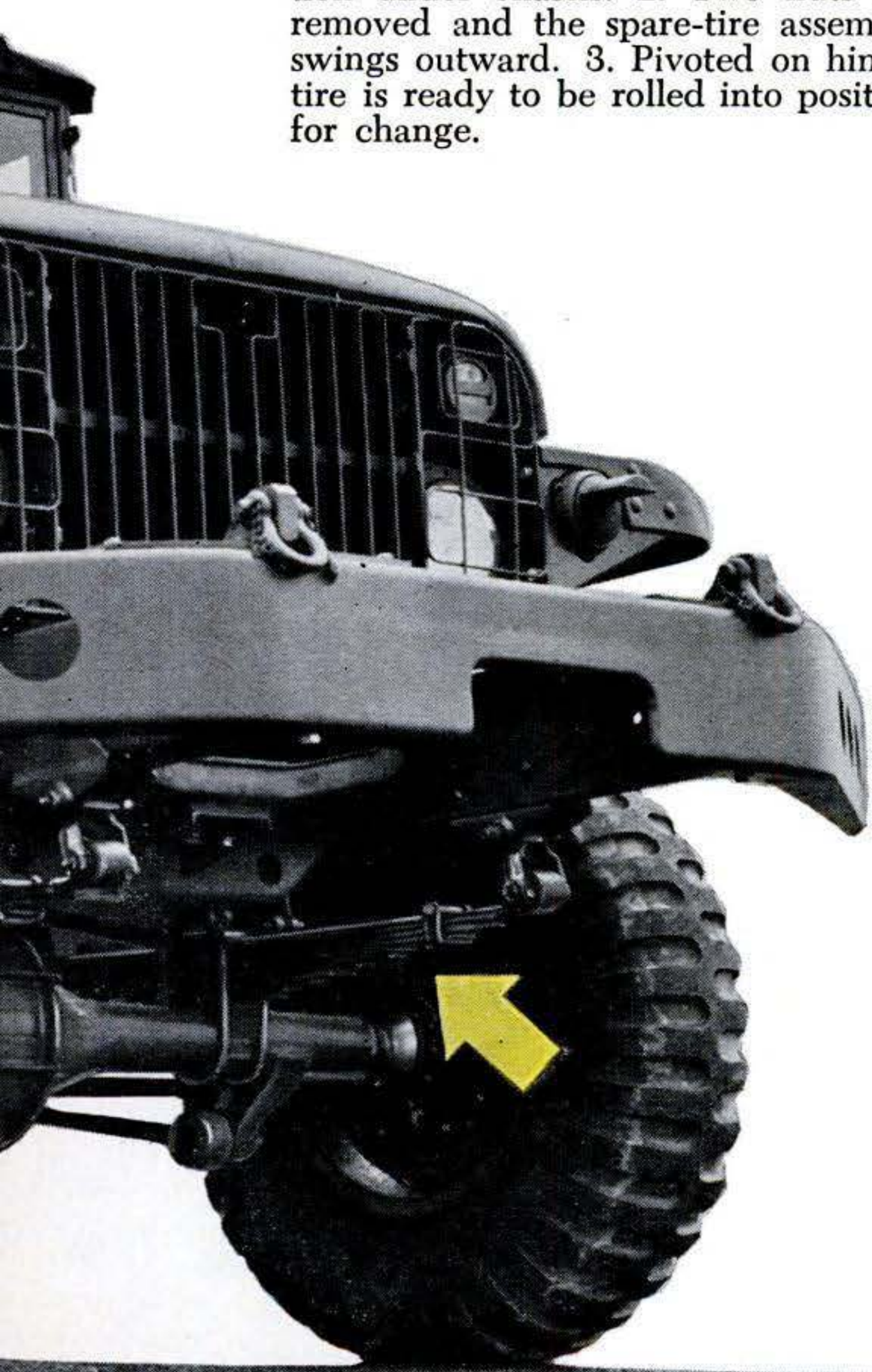
One lever does the work. Shown in its different positions above, it handles all transmiss.on control. Engagement of front-wheel drive is automatic. Only choice driver has to make is selecting high or low range, "level" or "hilly" in either range.

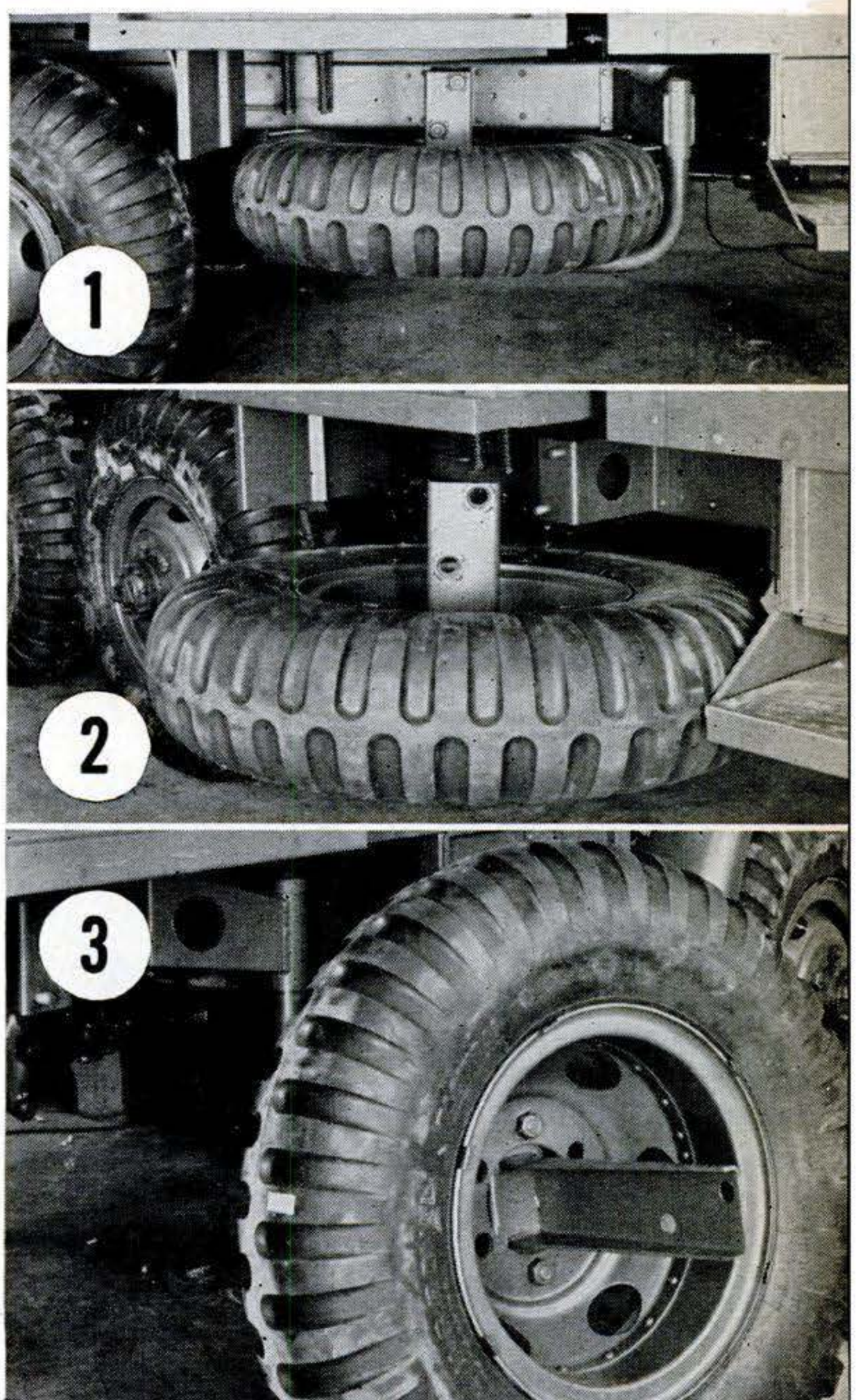
A new six-cylinder (302 cu. in.) engine, developing 145 hp., gives the GM six-by-six (meaning six wheels, all six power-driven) a top speed of 58 m.p.h. under a five-ton load. And with a full load, it can tow a five-ton 155-mm. gun behind it.

Snorkel devices enable the M-135 vehicle to make like a submarine. While older models could be adapted for underwater rides, the new truck has the sealed transfer case, transmission and the rest built in. When about to submerge, the driver flips a switch, forcing compressed air into these units to keep them bone dry.

Another improvement is torque-rod suspension in combination with regular leaf springs. These rods let the axles move up and down, but not forward or rearward. The result: a smoother ride and rabbit speeds over mountain-goat country. END

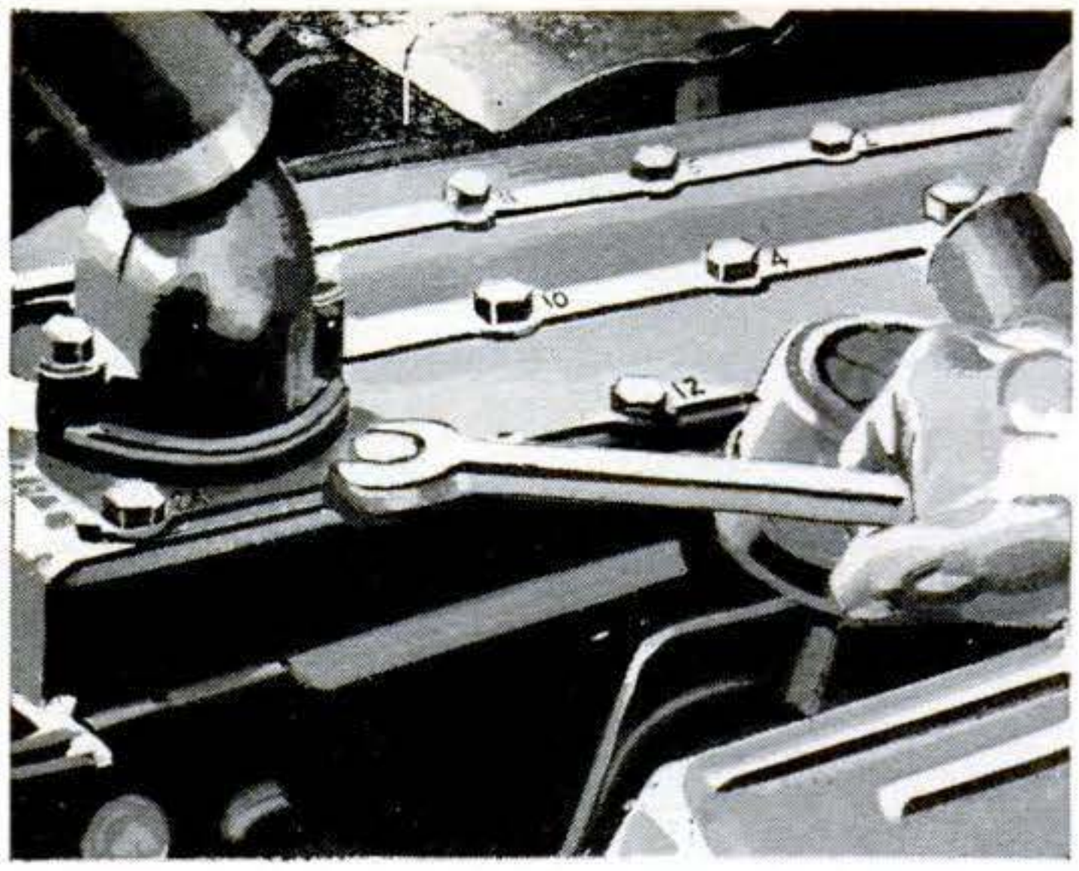
Service is faster on the new GM six-by-six. Tire change, shown at right, is an example. 1. Tire in driving position under chassis. 2. Two nuts are removed and the spare-tire assembly swings outward. 3. Pivoted on hinge, tire is ready to be rolled into position for change.



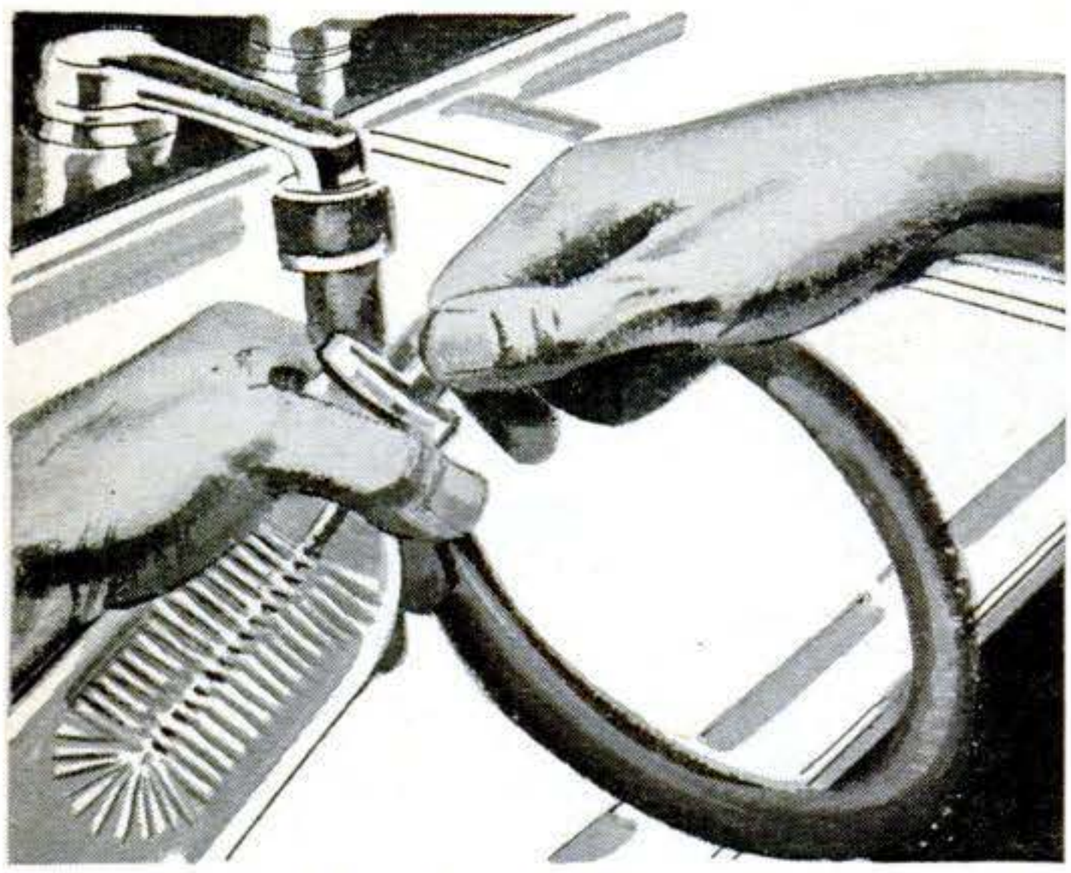


I'd like to see them make...

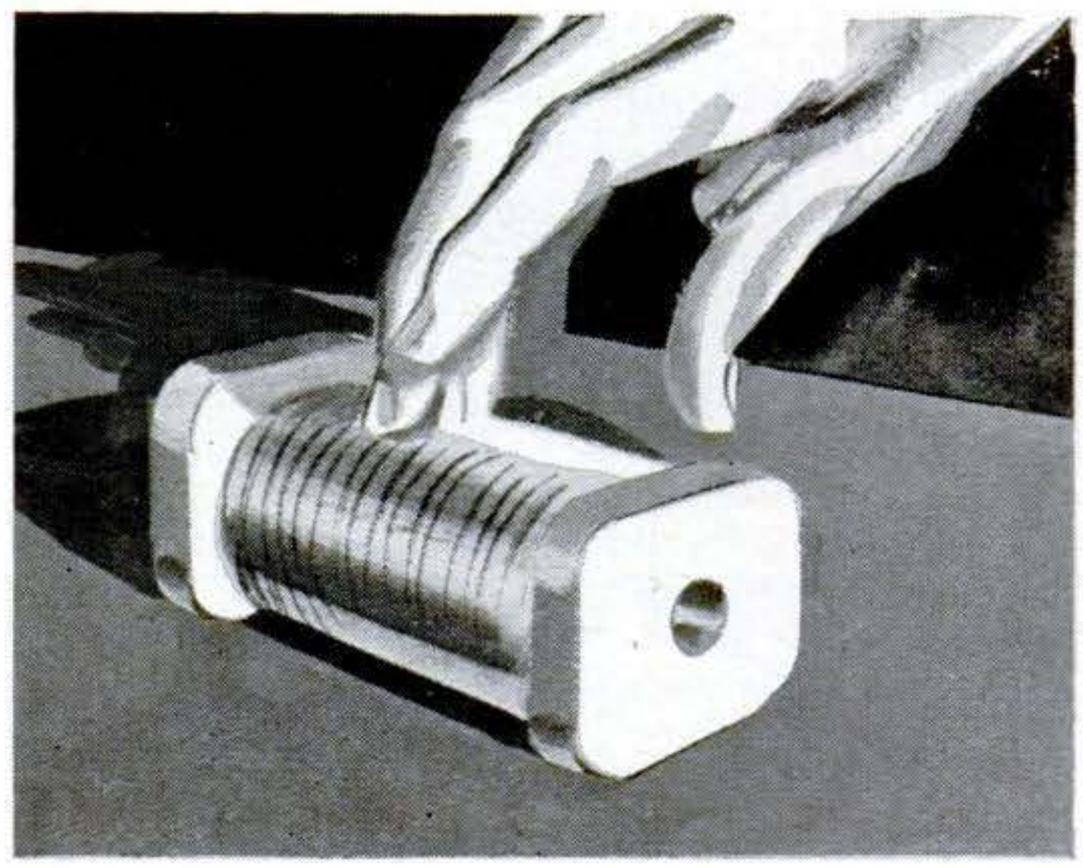
Everyone has his own pet idea of some gadget he would like to see in general use. What is YOURS? *Popular Science* will pay $5.00 for each one published. Use government postcards only. Contributions cannot be acknowledged or returned.



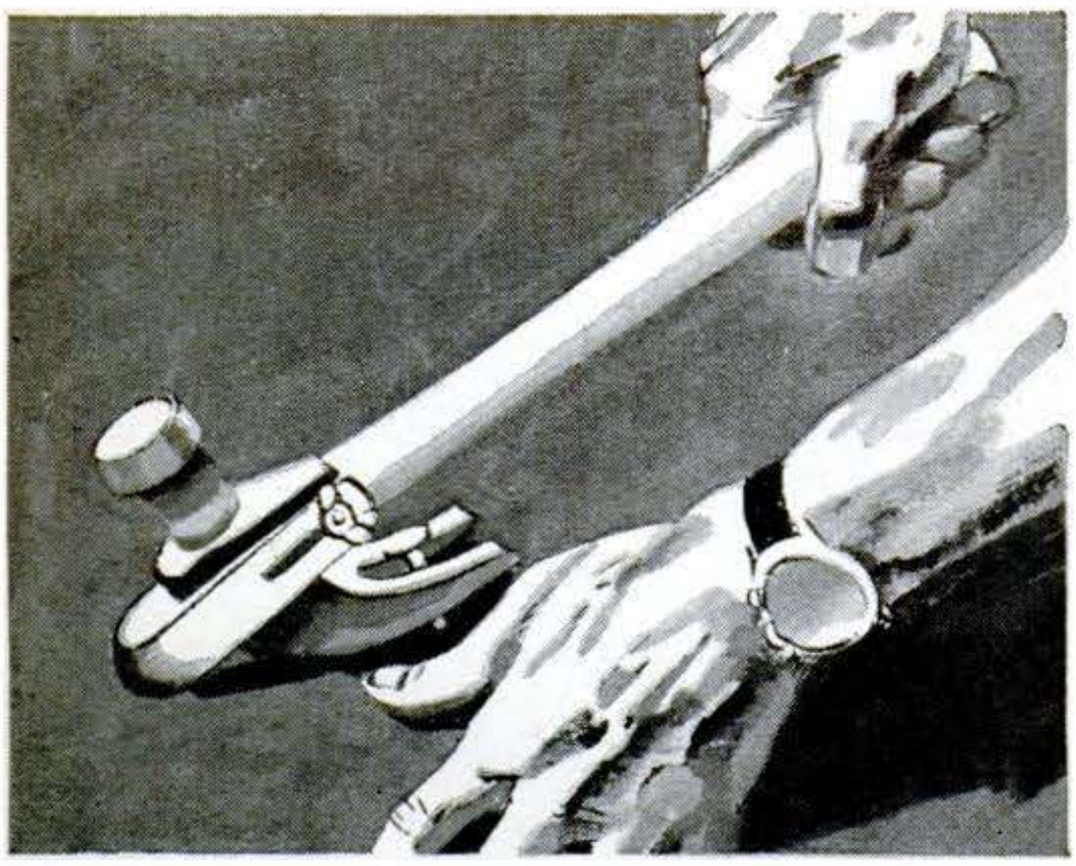
Automobile cylinder heads with bolt holes numbered in the order in which the bolts should be tightened. Proper tension for tightening nuts and spark plugs could also be indicated. —*George A. Jacobs, New Haven, Conn.*



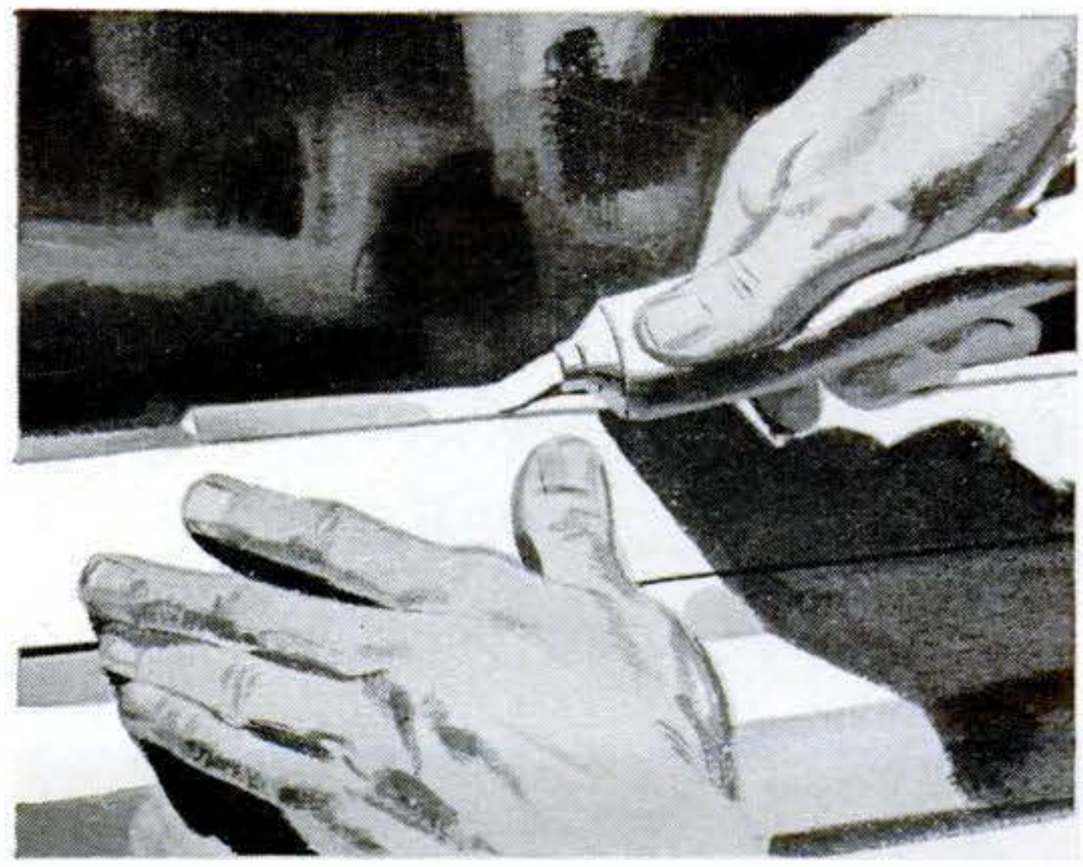
A bottle-washing brush that attaches to the faucet and is rotated by waterpower. Add a built-in soap feeder so soapy water would squirt out through holes around the bristles.—*Mrs. Dorothy Riley, Brooklyn.*



Square flanges on spools of sewing thread, magnet wire, and the like. If you dropped such a spool, it would stay put instead of rolling out of sight and unwinding its contents on the way. —*Martin Reddoor, Poplar, Mont.*

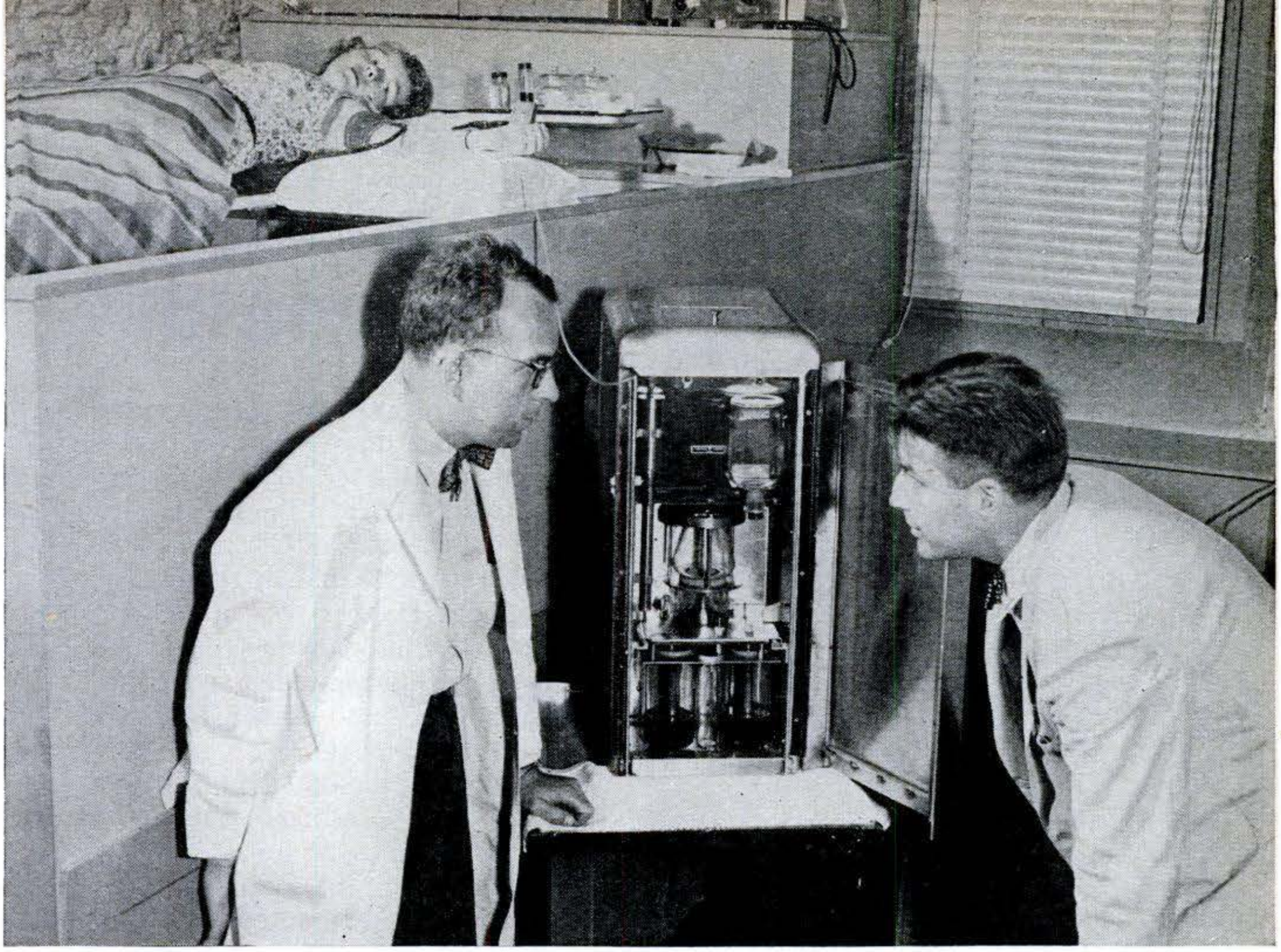


A hammer with a U-shaped rocker fitted over the head and fastened with wing nuts. Adjusted as a fulcrum for the head, it would give leverage for pulling nails, eliminating need for a block. —*Arthur Ammann, Brooklyn.*



Putty in collapsible tubes with triangular neck openings. The putty would be extruded in a triangular strip, ready-shaped for application in the glass rabbet of window sash.—*H. Wadron, White Plains, N. Y.*

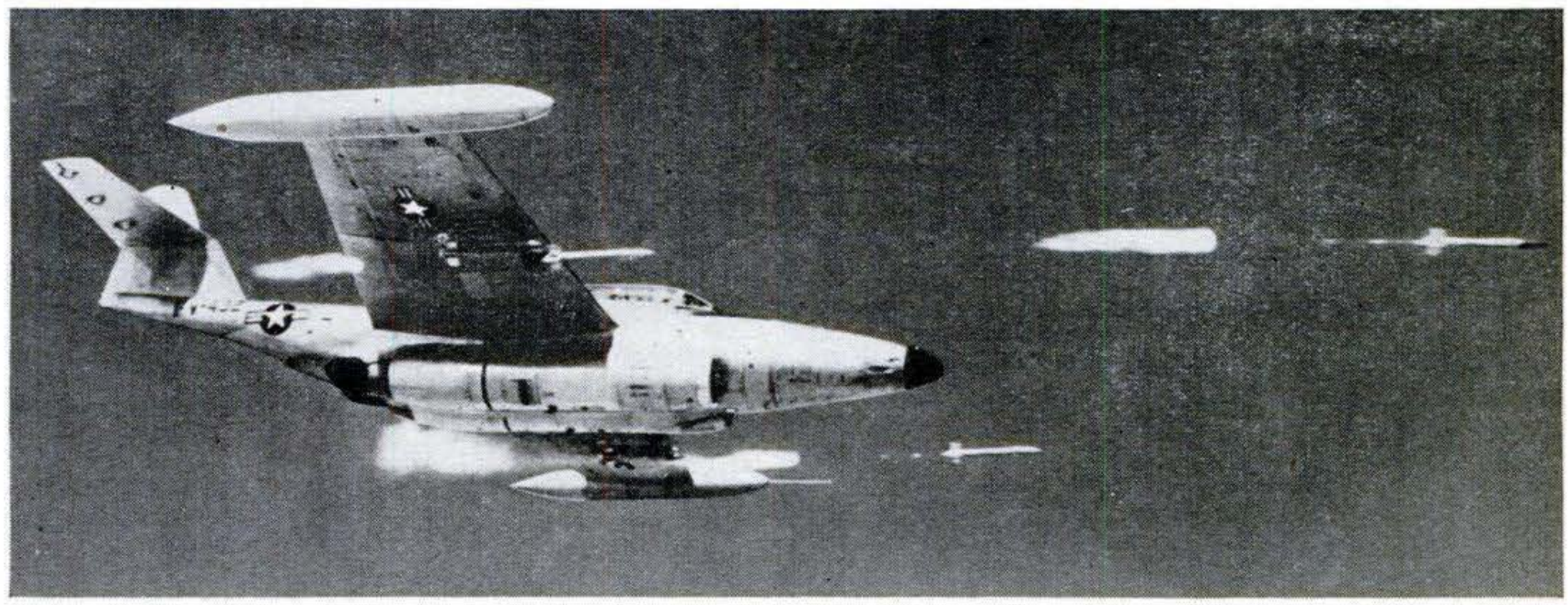
Copyrighted material



Fast Separation Preserves Blood

A SUITCASE-SIZE blood refinery can now separate whole blood into its life-saving components while it is still flowing from the donor. This on-the-spot processing prevents enzymic action that causes blood to break down, and may thus make it possible to keep blood fractions fresh much longer (see PS, Sept. '51, p. 147).

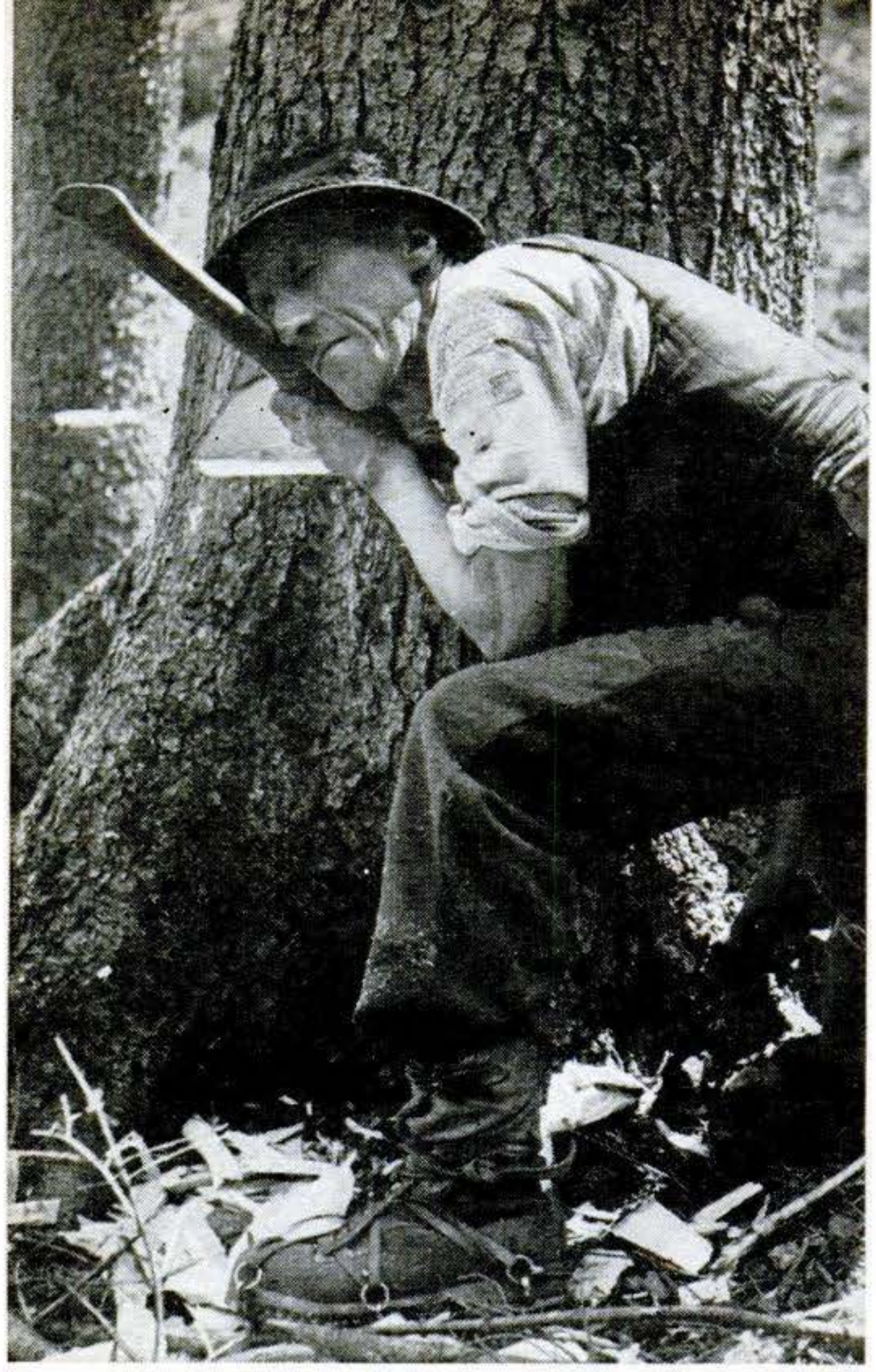
The portable fractionator, a pilot model, has been developed by Dr. Edwin J. Cohn, of Harvard, and by engineers of the American Optical Company. Blood flowing from the donor's veins goes through a tube that first removes calcium to prevent clotting. The blood is then cooled and enters a rapidly spinning centrifuge that separates the red cells from the plasma and automatically transfers each to its own sterile container.



Scorpion Shows Its Fangs

THE Northrop F-89 Scorpion, America's "basic defense aircraft," shows some of its stinging power as it unleashes three of the 16 five-inch rockets tucked under its wings. The Scorpion, whose armament was recently revealed for the first time (PS, May '51, p. 143), also carries six 20-mm. cannon. Twin Allison J-36 turbojet engines, side by side under the fuselage, power the 15-ton plane. Scorpions are now in service with Air Force units on the West Coast.

Copyrighted material



Felling timber hasn't been mechanized in the forests of the Austrian Alps. Here an old forester takes a sight along his ax handle to determine how a big spruce is going to fall.

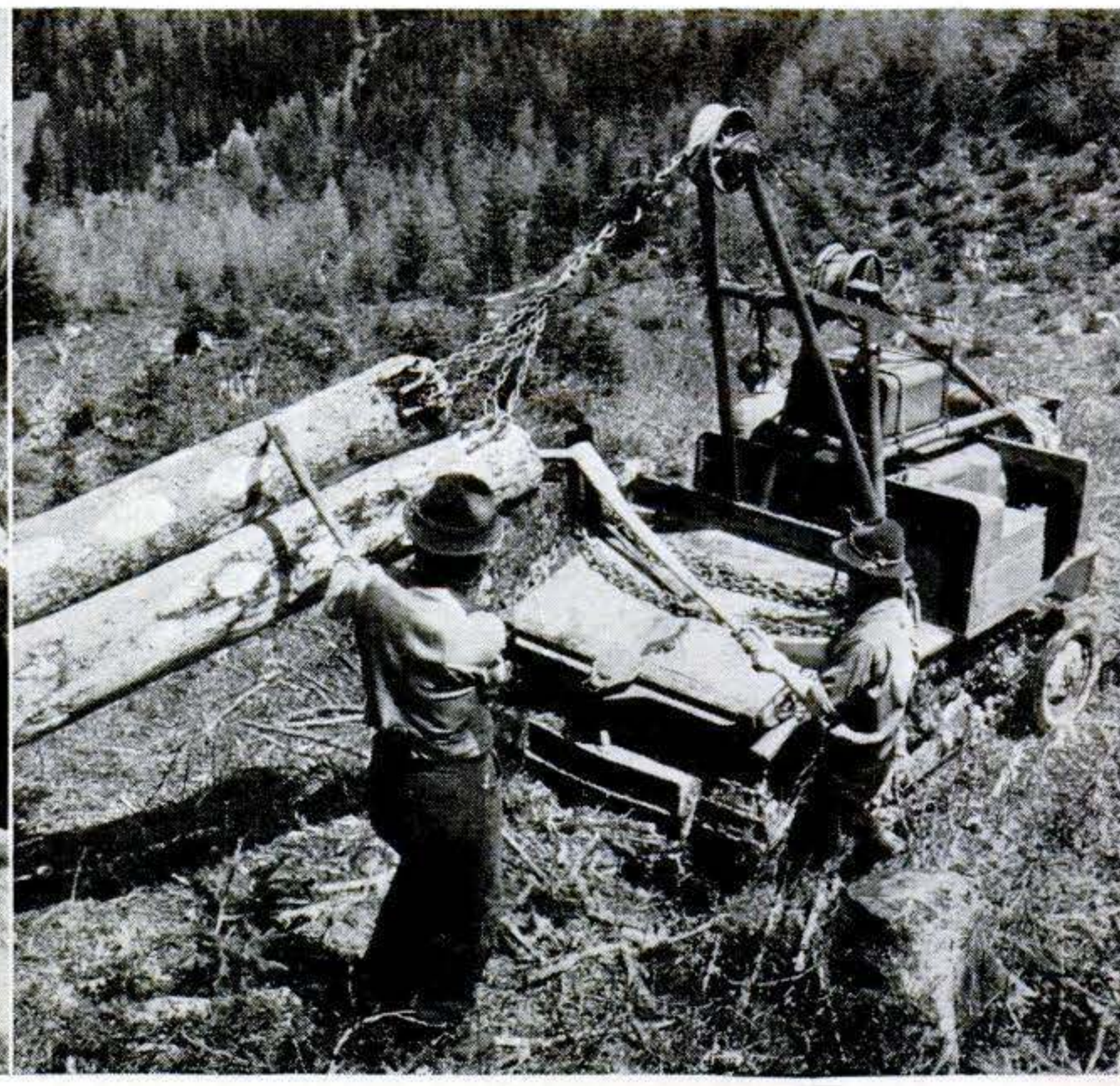
Power Mule Speeds Logs to Sawmill

EXPERT woodsmen of the Austrian Alps can fell a giant spruce in less than half an hour. But it used to be many months before the logs reached the nearest valley sawmill. That was before Oskar Hacker's Motormuli cut the time to a single day.

Engineer Hacker was appalled when he discovered that Austria's backward timber industry left spring-felled trees lying on the mountainsides until winter, when they could be slid down on the snow. An obvious job for tractors, he thought. But ordinary tractors were too heavy and wide for winding, roadless Alpine slopes, so he sat down to design one for the job. Some 2,000 drawings later he had what he wanted. Local manufacturers, however, didn't want what he had. Then a representative of the U. S. Economic Cooperation Administration saw his plans, put up the money, and Hacker's Motormuli was born.

Trimmed logs are chained together for loading. Previously, timber cut in spring would wait for winter snows to be slid down mountain slopes. Oxen helped part of the way.

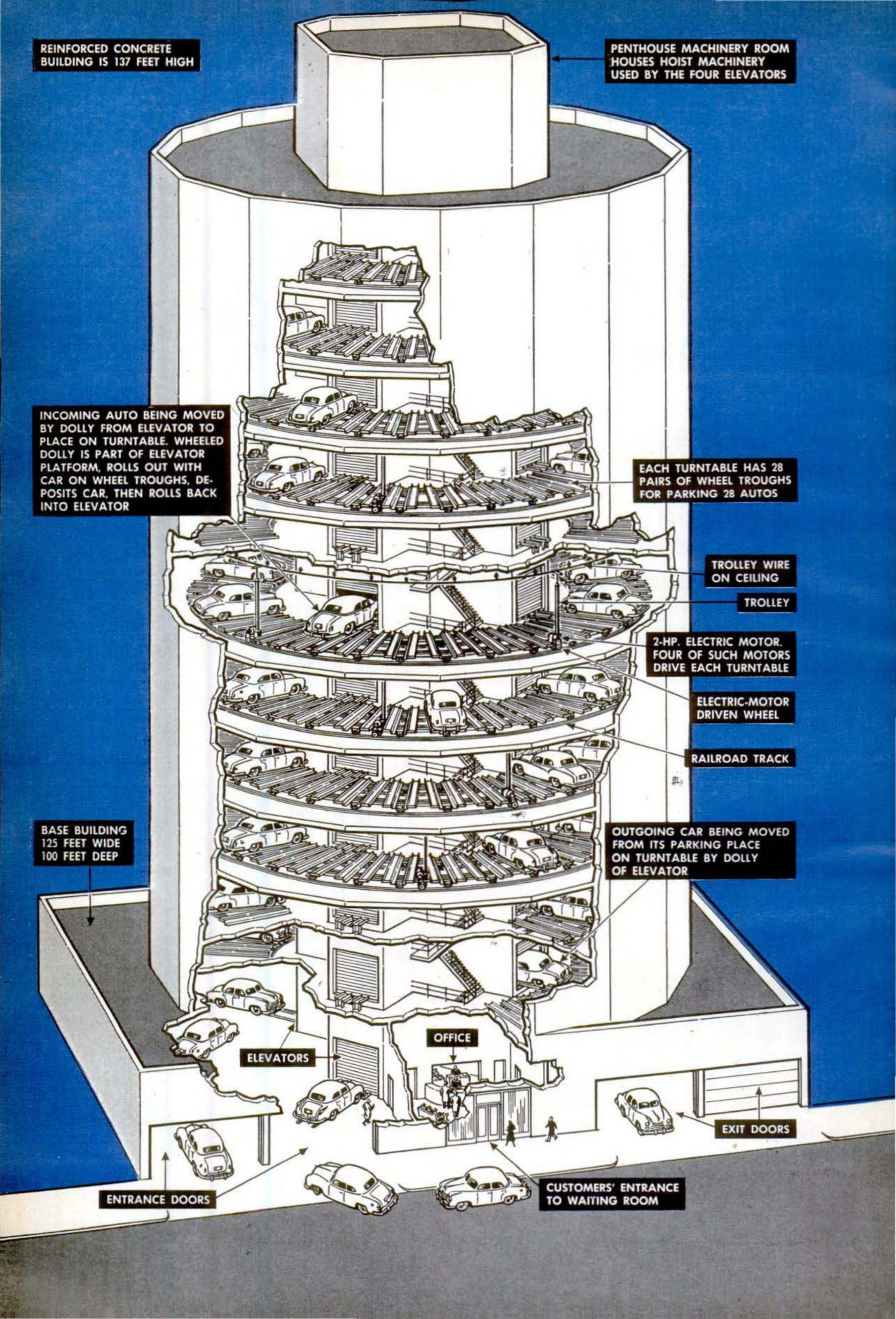
Built-in winch pulls log load onto trailer. Most of load weight is dragged. A turntable, rotating on a spherical joint, enables tractor unit to negotiate tortuous mountain trails.



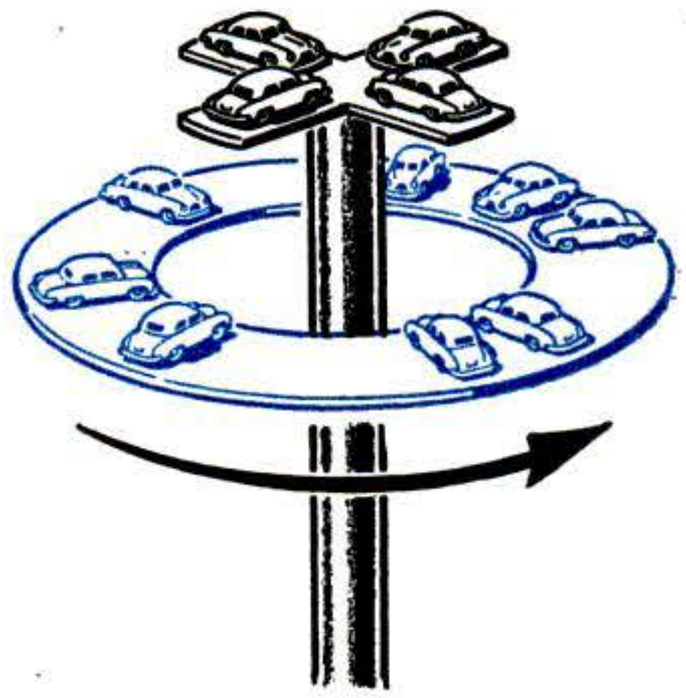
Copyrighted material

The old and the new meet. Note small load behind oxen compared to five tons of logs being hauled by the 3½-ton Motormuli. Diesel engine is a four-cylinder 60-hp. Steyr.

Village audience greets Motormulis at valley destination after a one-day journey from forest timber stands. Rear tractor is smaller version, with two-cylinder engine of 26 hp.


REINFORCED CONCRETE BUILDING IS 137 FEET HIGH
PENTHOUSE MACHINERY ROOM HOUSES HOIST MACHINERY USED BY THE FOUR ELEVATORS
INCOMING AUTO BEING MOVED BY DOLLY FROM ELEVATOR TO PLACE ON TURNTABLE. WHEELED DOLLY IS PART OF ELEVATOR PLATFORM, ROLLS OUT WITH CAR ON WHEEL TROUGHS, DEPOSITS CAR, THEN ROLLS BACK INTO ELEVATOR
EACH TURNTABLE HAS 28 PAIRS OF WHEEL TROUGHS FOR PARKING 28 AUTOS
TROLLEY WIRE ON CEILING
TROLLEY
2-HP. ELECTRIC MOTOR. FOUR OF SUCH MOTORS DRIVE EACH TURNTABLE
ELECTRIC-MOTOR DRIVEN WHEEL
RAILROAD TRACK
BASE BUILDING 125 FEET WIDE 100 FEET DEEP
OUTGOING CAR BEING MOVED FROM ITS PARKING PLACE ON TURNTABLE BY DOLLY OF ELEVATOR
OFFICE
ELEVATORS
EXIT DOORS
ENTRANCE DOORS
CUSTOMERS' ENTRANCE TO WAITING ROOM

"Merry-Go-Round" to Park Cars



IF YOU'VE ever wheeled 'round and 'round the block searching vainly for a place to park your car, where Sam Spade himself couldn't track down a spot big enough for a junior-grade scooter to squeeze into, take a look at this. It's the Rotogarage, latest answer to the parking problem in traffic-jammed city streets.

This multi-story automatic parking tower, its designers claim, could accommodate 400 cars on a plot 100 by 125 feet—seven times as many as a parking lot of that size. Rates will be about the same.

Here's how the Rotogarage works: The parking floors are turntables, stacked like a platter of pancakes on a central column of four elevator shafts. You drive in on the ground floor, stop your car in front of one of the four elevator doors, cut the engine and get out.

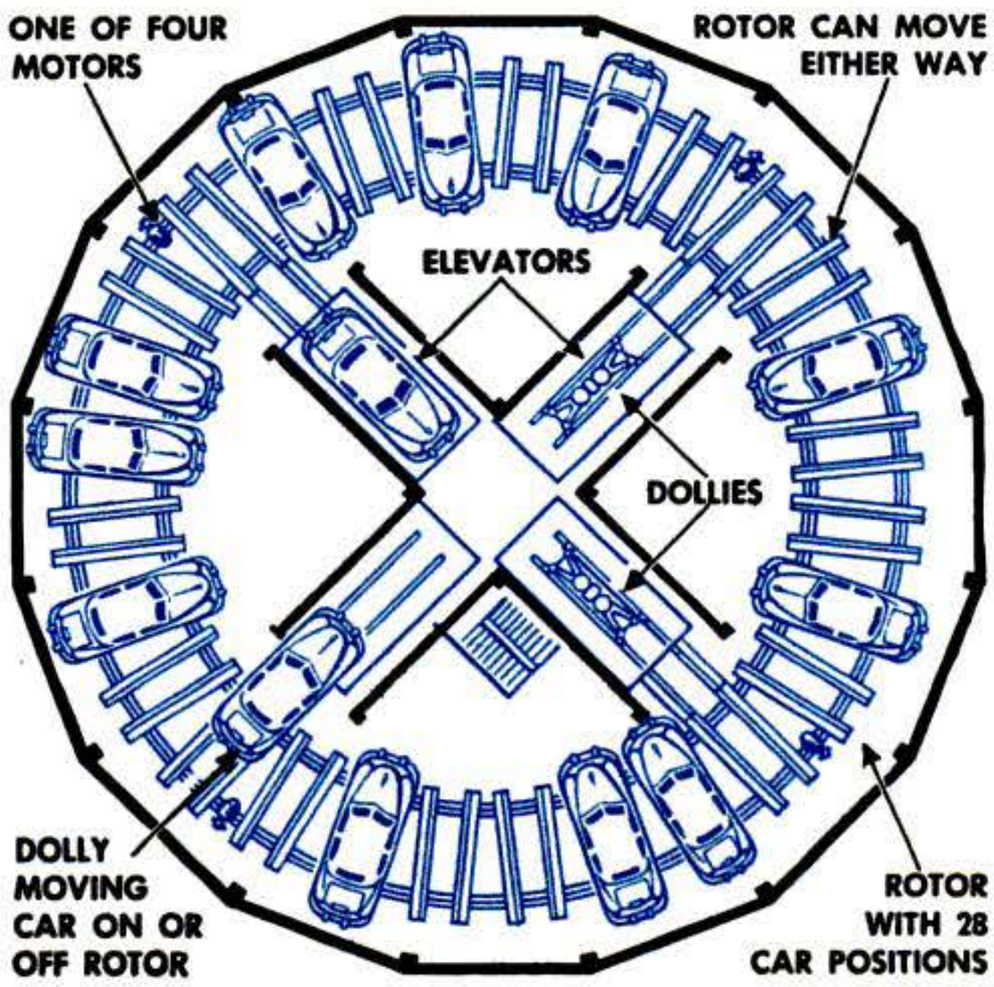
A dolly emerges from the elevator, lifts your car a few inches off the floor and pulls it into the elevator, which carries it up to one of the rotor floors that has an empty slot on its turntable. While the car is rising, the turntable is rotating to present its vacant spot in front of the elevator door.

The elevator stops and the doors open, turning on a floodlight. The dolly runs your car out and deposits it on the turntable. If another auto has been called for, the elevator takes it down on the return trip.

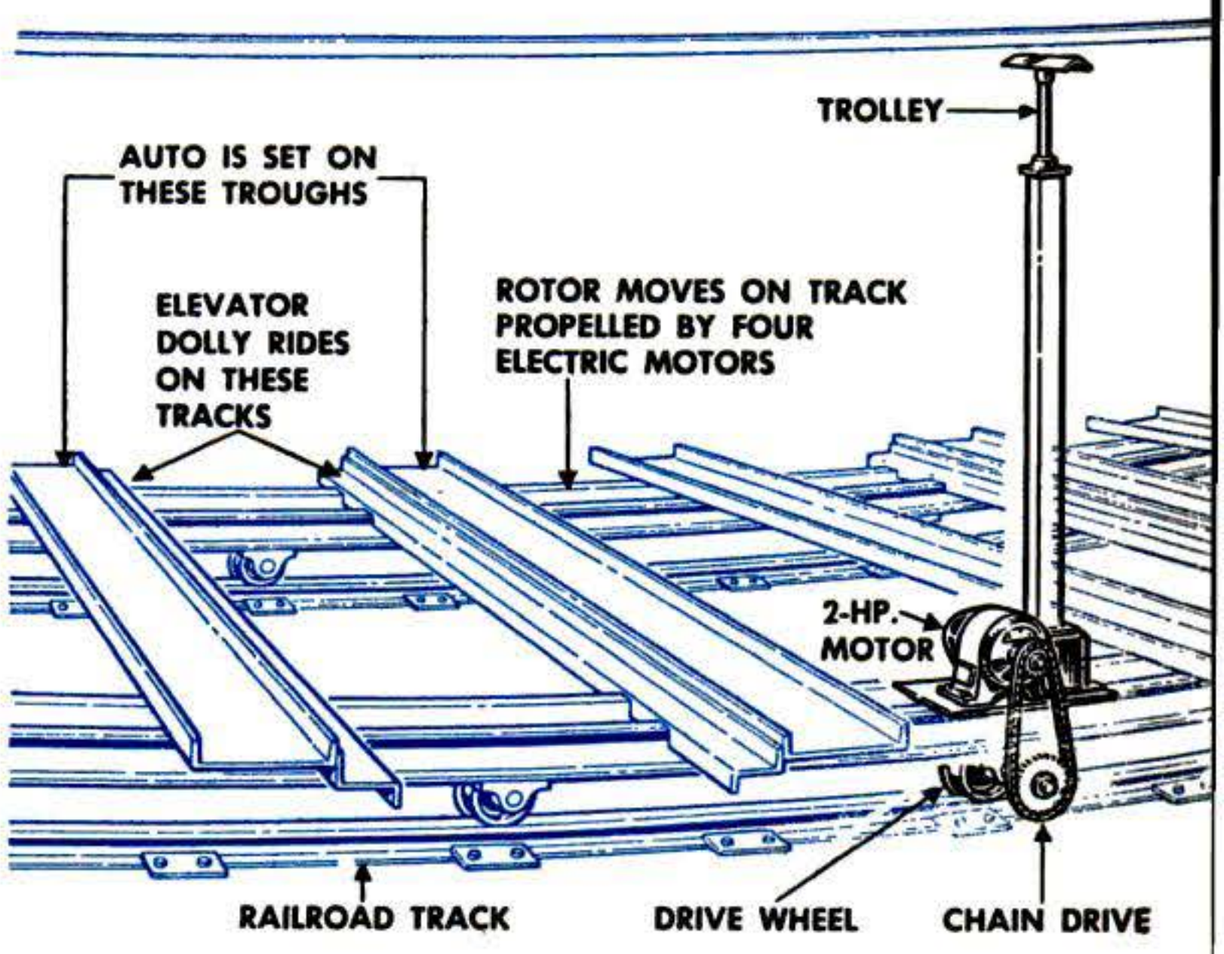
Average elapsed time from the opening of the elevator doors to receive a car until the car is stored and elevator returns to ground floor: one and one-half minutes.

Since its construction conforms to the standards of the Federal Civil Defense Administration, the Rotogarage would also serve as an effective bomb shelter in case of atomic attack.

Towers are being planned, by Rotogarage Parking Units Co., for New York, Boston, Washington and Philadelphia. END.



Floor plan shows method of operation. Rotor, encircling four elevators, stores 28 cars, with three more in dead space between elevator shafts.



Rotor revolves on tracks, chain-driven by four electric motors mounted on outer rim. Each motor is powered by a trolley stick that rides against an overhead power line.

Copyrighted material

Italy and England are the main sources of genuine alabaster, from which the base of this lamp was made. It was imported from Italy by the House of Italian Handicrafts, Inc., N. Y. C.

Television Lamps Dug from Ancient Mine

Alabaster, the translucent stone so valued for vases and statues by the Romans, is now being put to an up-to-the-minute use.

THE Romans didn't have television in mind when they first began digging alabaster from the hills in Staffordshire, England, some 2,000 years ago. They made the translucent white stone into a variety of ornaments and statues.

Today the soft stone is being used for special table lamps good for their warm, soft glow when the television set is turned on. Helps you keep your eye on Junior when he wants to shoot TV cattle rustlers with his new air rifle.

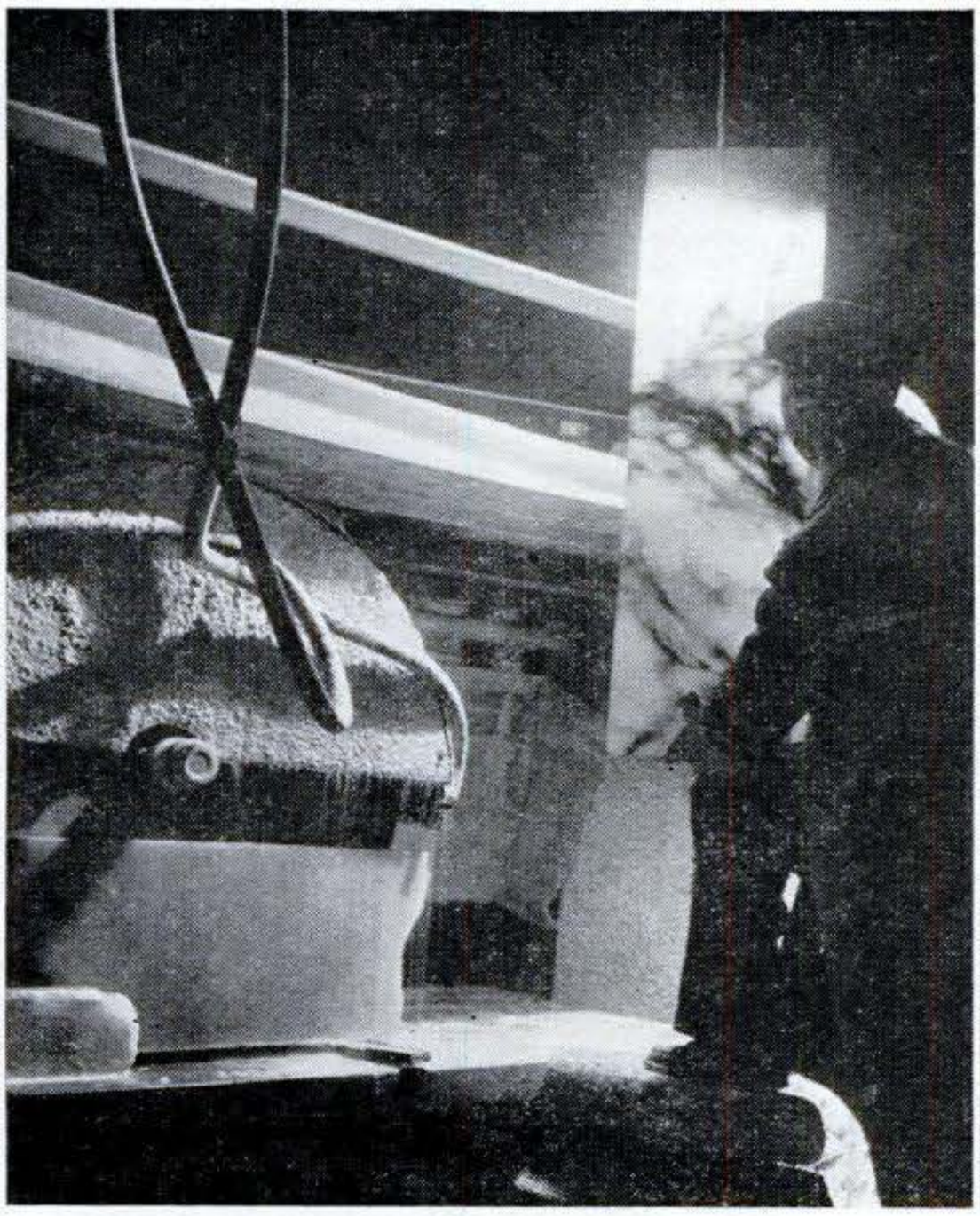
The huge blocks are quarried in this old mine under a hill honeycombed with mine galleries since Roman times. Carefully worked from the rock face, they are moved to the factories where the blocks are sawed into more manageable shapes.

The smaller chunks can be turned on lathes as easily as wood and can be cut, sawed, ground and polished.

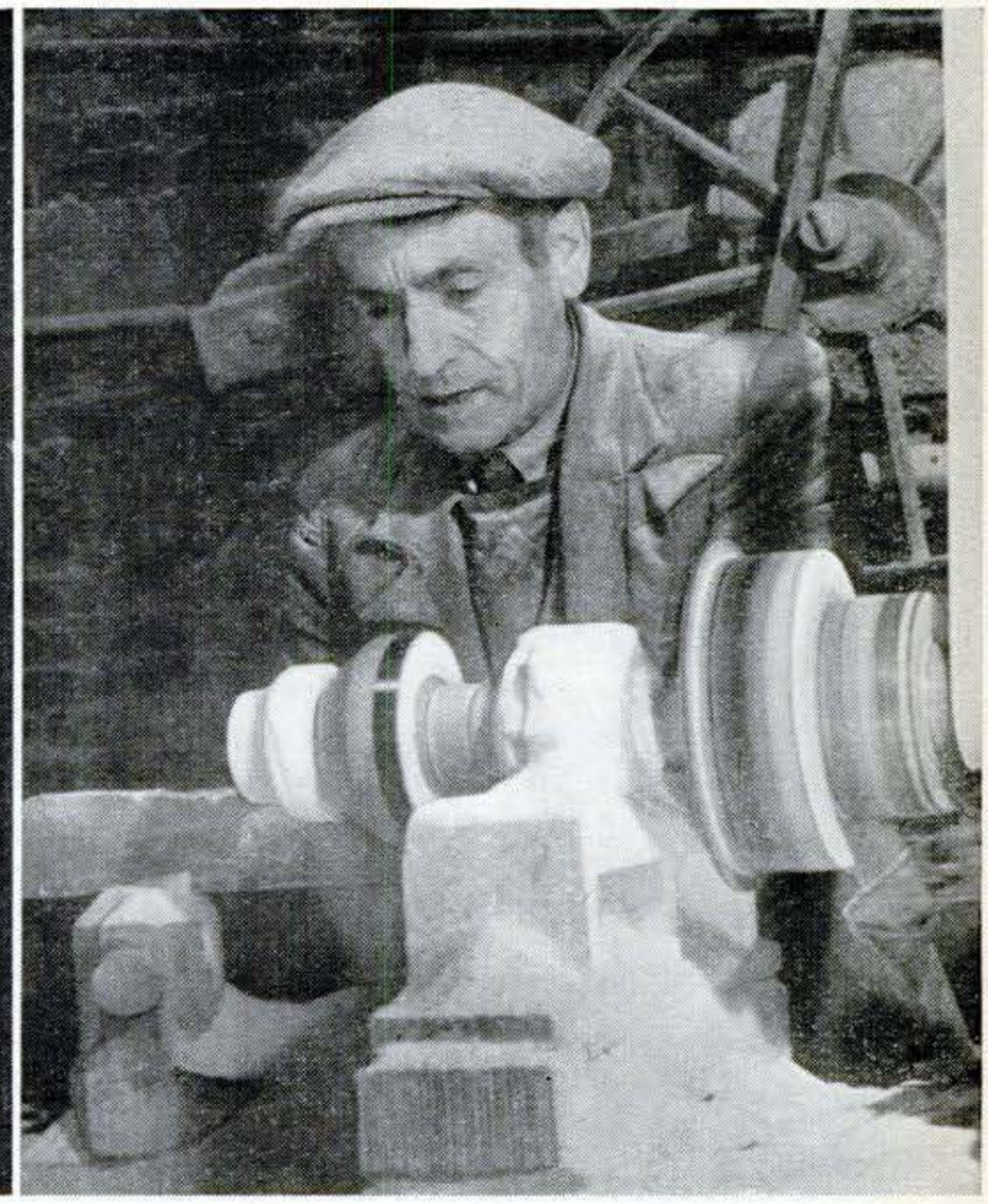
The fragile stone is easily scratched and needs some care in handling, but finished articles of alabaster—book ends, lamps, lamp shades, clocks, powder bowls, cigarette boxes, ash trays and a host of other products—are safely sent through the world today as alabaster has been for centuries.

Copyrighted material

At the factory freshly mined alabaster blocks are sawed into convenient sizes. The stone can be sawed like wood but needs a little more patience. The smaller, more easily handled pieces then go to the workshops to be carved or cut into shape.



A circular saw, tipped with Carborundum and bathed with water, cuts the stone into slabs. The workman is holding up a fresh-cut slab to the light to show its translucence and brown veining. Some alabaster is pure white, and it all has a "light" appearance.

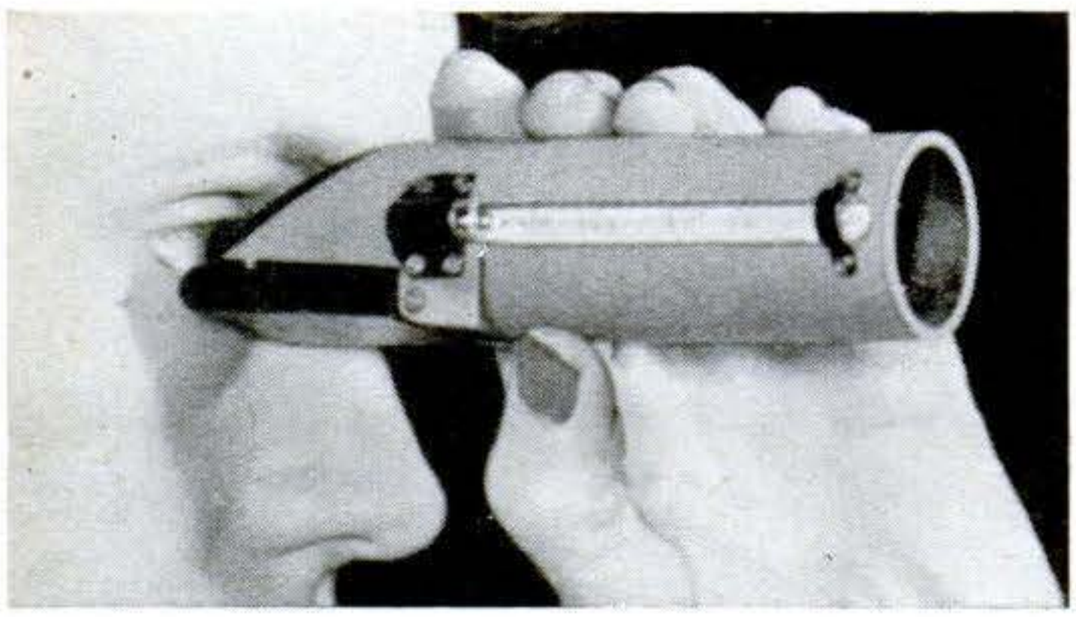


You can turn alabaster on a lathe. This "Kerver" or carver has been at it for 40 years, shaping the stone into hundreds of designs. Many of the lamps reproduce the designs of ancient Greek vases. The white dust is gypsum, of which alabaster is one form.

Copyrighted material

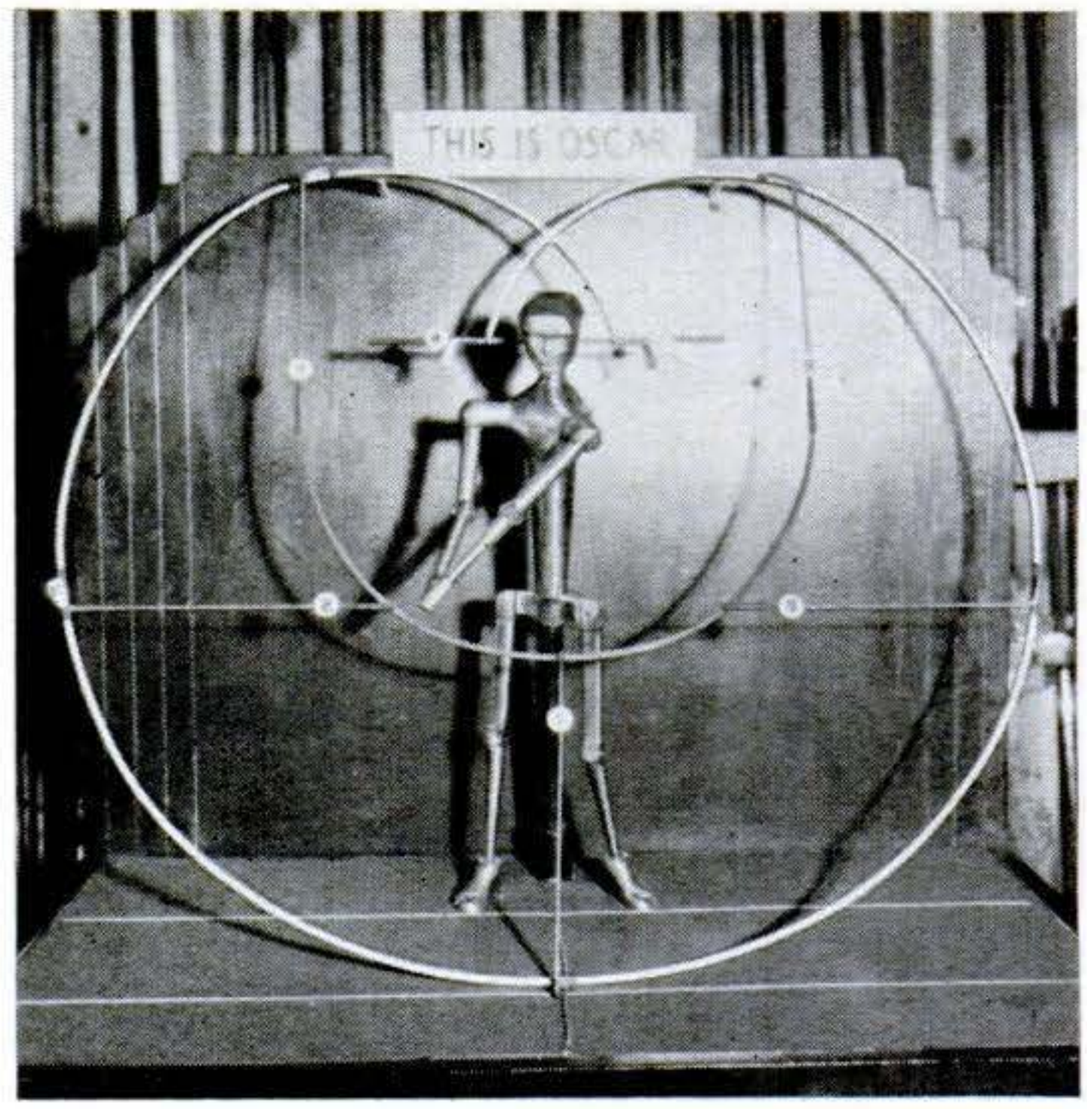
Stretched Steel Is Stronger

BOTH these metal sheets contain the same amount and quality of steel, but the latticed one is stronger, remaining rigid even while bearing the combined weight of a man, the solid sheet and a block, as shown above. Made by slitting and stretching solid steel in a press, it is said to gain increased strength from the vertical slant of the thin ribbons. Wheeling Corrugating Co., Wheeling, West Va., developed the sheet.



Water in Honey Measured

THIS new pocket-size refractometer helps the honey tester tell at a glance the amount of moisture in a sample without referring to conversion charts. The instrument, made by Bausch & Lomb Optical Co., Rochester, N. Y., measures how much light rays bend when passing through the honey. This varies directly with the water content of the sample.



Robot Golfer Never Misses

THIS golfer's form is perfect—it never varies an inch. He's Oscar, a mechanical robot designed by Clifford H. Landis of Chicago to demonstrate the perfect golf swing in slow motion. Hips, shoulders, arms and head turn in perfect time, driven through shafts from a motor in the base.

Jets Get Sleek Fuel Tanks

THE long, sleek object suspended from the plane wing above isn't a bomb. It's an ultramodern auxiliary fuel tank, designed to cut down wind resistance in the Air Force's high-speed jets to an absolute minimum. Made of aluminum, the three-section tank is held together by a tie rod that runs from the bullet nose to the tapered tail. Length of the tank's center section varies according to individual flight requirements.

Copyrighted material

Here Comes the Convertiplane

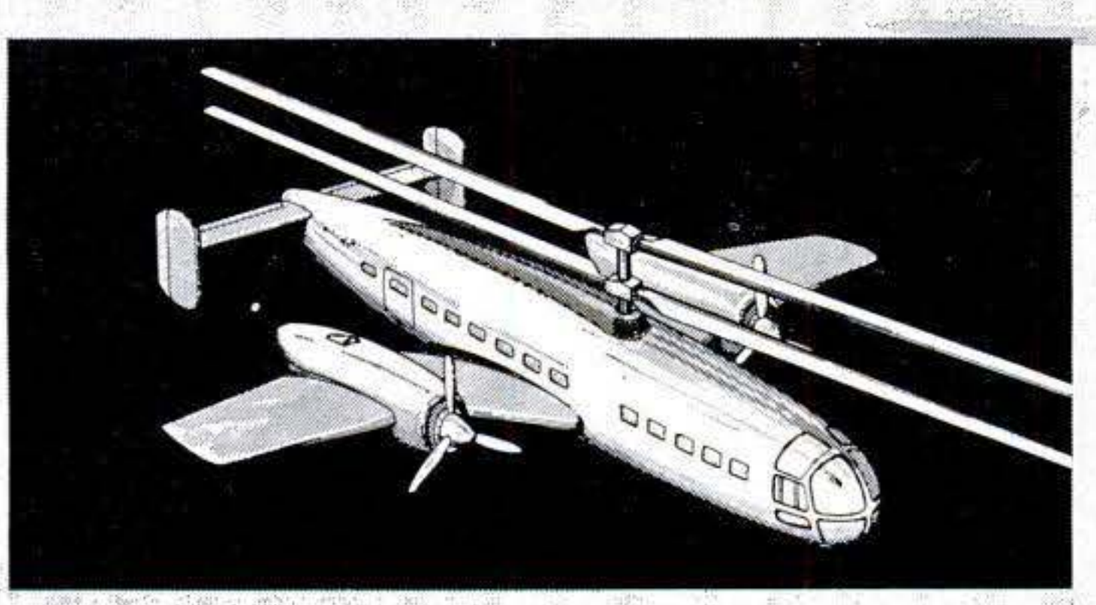
Experimental Helidyne at left has no wings, depends on rotor blades for lift even during forward flight as an airplane.

THE Helidyne is an early bird in its field. While three manufacturers are working on Air Force contracts to design a convertiplane, the Gyrodyne Company of America went ahead and put just such an aircraft in the air. It takes off straight up as a helicopter, switches in mid-air to forward flight as an airplane, then reconverts to a 'copter for a vertical landing.

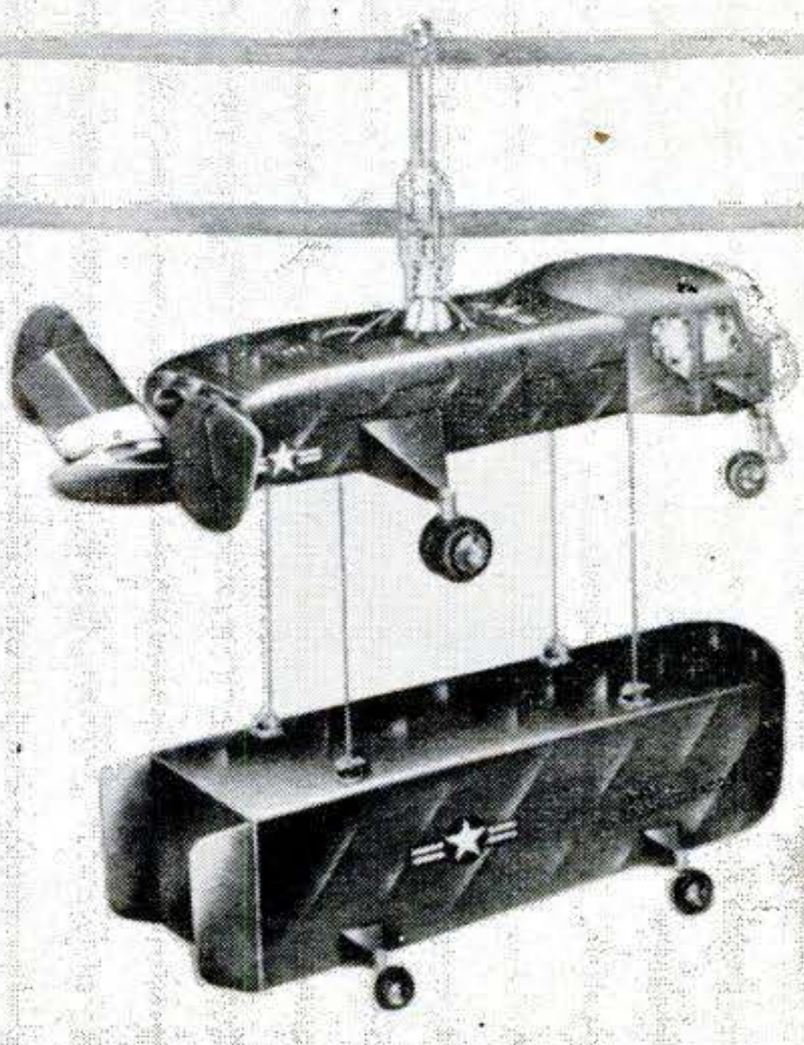
They did it by simply sticking an engine driving a conventional propeller on either side of a helicopter fuselage. Coaxial helicopter blades carry the Helidyne straight up to gain altitude and provide some forward speed. Then the propellers gradually take over forward thrust, giving the craft greater forward speeds than it could attain as a pure helicopter.

The Helidyne shown at the top of the page is admittedly experimental—but it has flown, and brings another old aviation dream closer to reality.

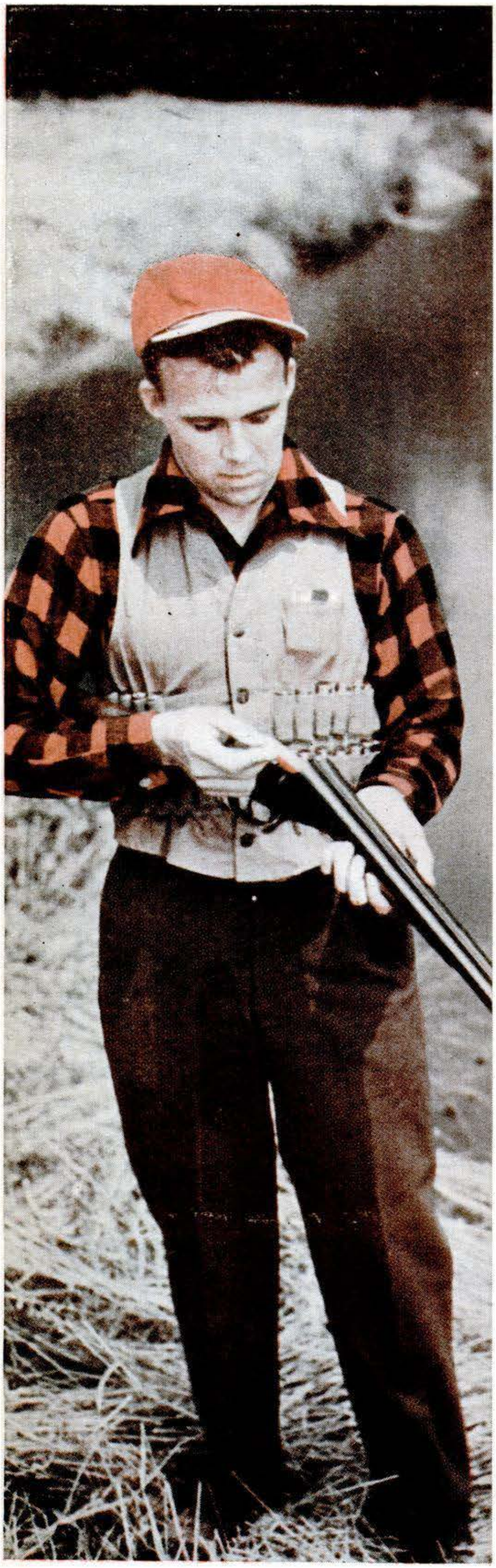
Model on drawing board has stub wings added. In fast forward flight they will take over full lift while rotor blades are locked.



Convertiplane liner of future may carry over 50 passengers at speeds greater than 350 m.p.h.



Helicopter transport below hovers while winches raise a cargo pod into position from the ground. It may have a convertiplane version.



How They Make Shotgun Shells

Exacting manufacture, step-by-step inspection and endless research pay off in take-it-for-granted performance.

By Kendall W. Goodwyn

CACKLING like an outraged spinster, a big pheasant flushed from the tall grass and started to take off like a Thunderjet for the wild blue yonder. The hunter's gun came up fast and smooth, leading the gaudy game bird just enough to let him fly into the shot column, and *wham!*

"Nice shooting, Ed," said the other man as the ringneck went into the bag.

"Thanks, Jim," Ed grinned. "I'll give the gun a little credit—and," he added, slipping in a fresh shell, "this ammo is okay too."

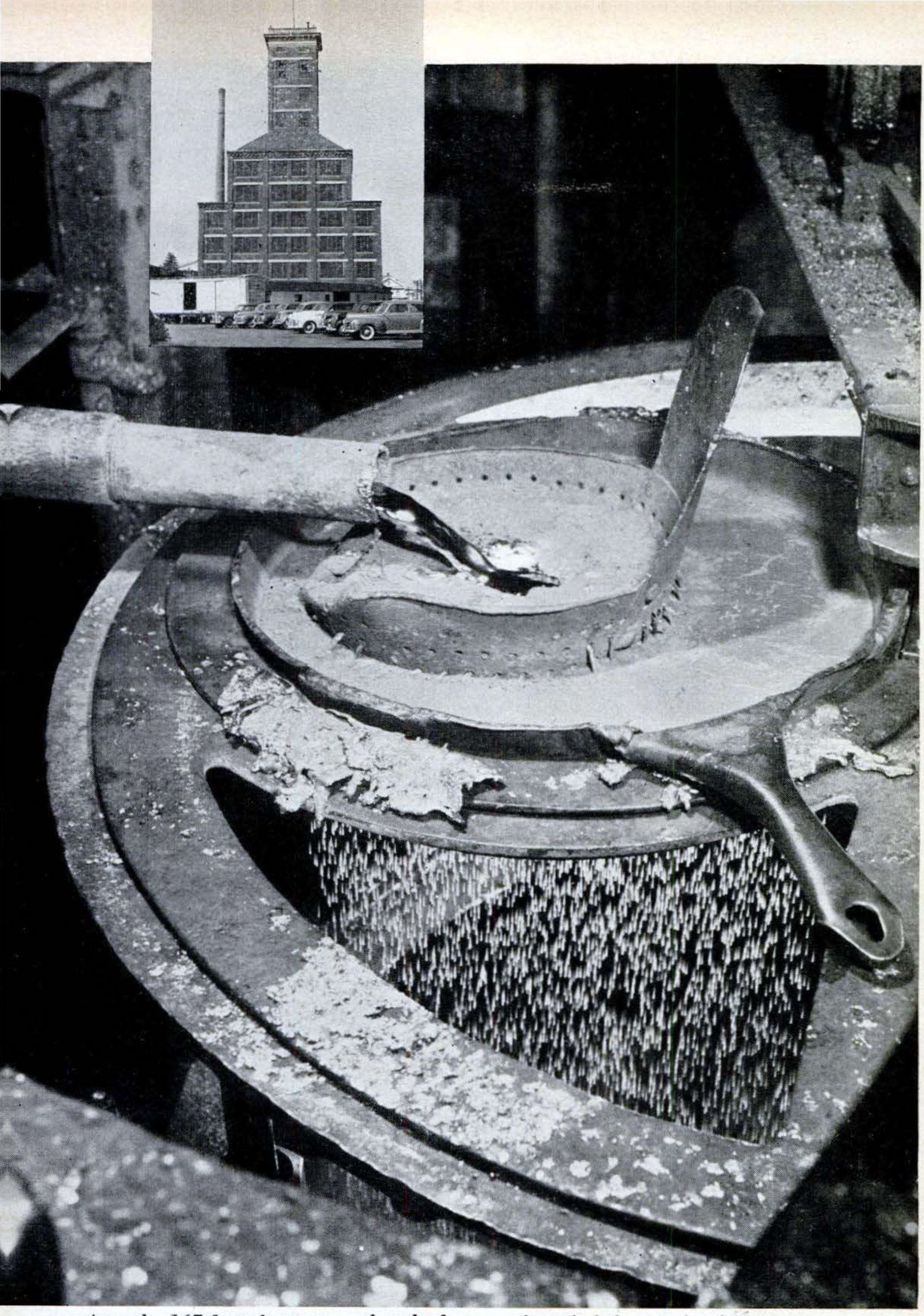
The fact is, modern shotgun ammunition is so *darn* good we rarely stop to think about it. Hold a shot shell in your hand and it looks pretty simple. Brass head and paper body—primer on one end, the other heavy with shot. But that simple-appearing item contains 14 components which are made and assembled in an intricate manufacturing process requiring 212 operations.

Let's visit the Bridgeport, Conn., plant of the 135-year-old Remington Arms Company —where they turn out 1,800,000 shotgun shells a day—and get an idea how it's done.

Shot Making Carefully Controlled

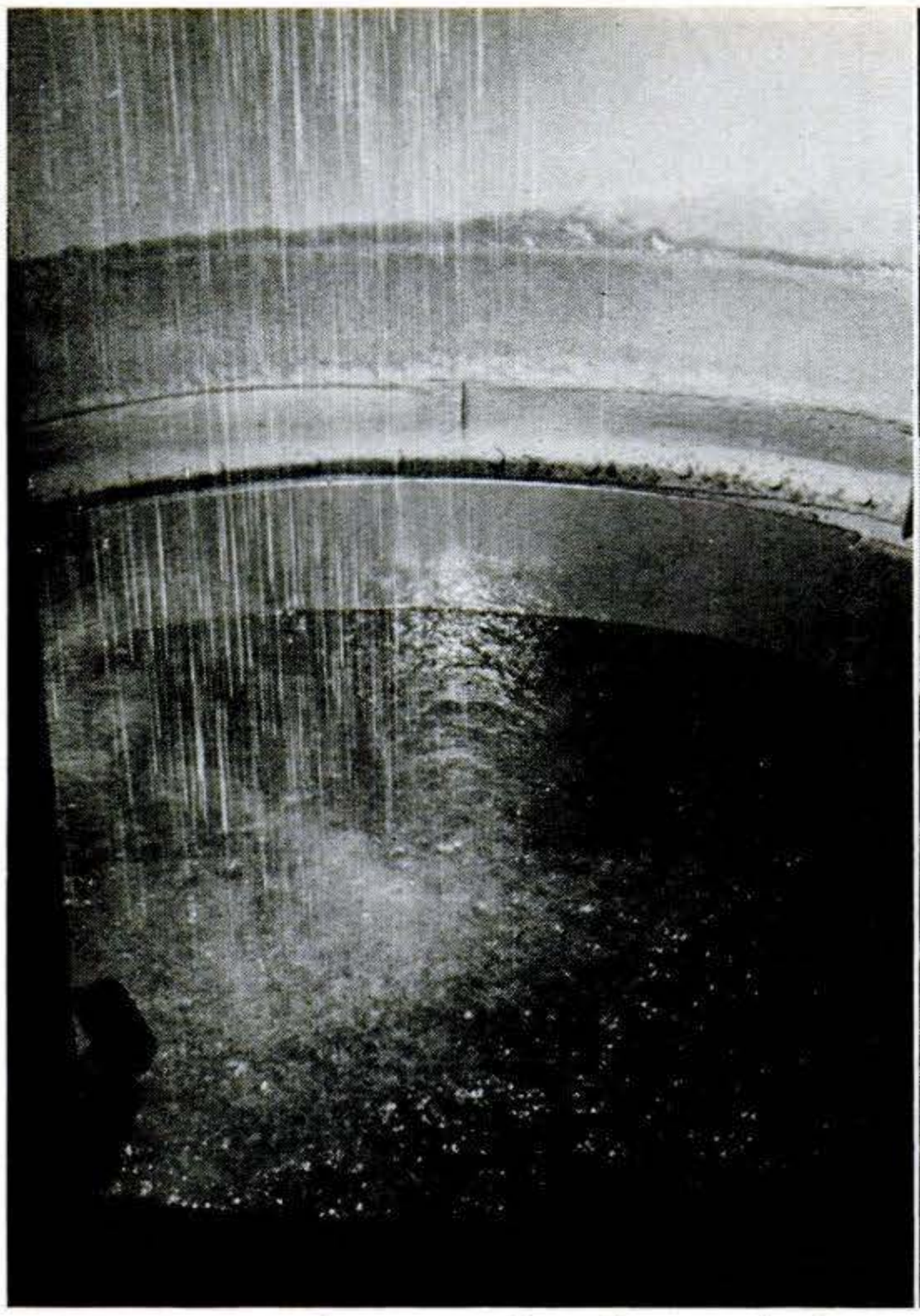
The shot tower is a good place to begin. Strangely enough, they still make shot much as they did in the days when George Washington loaded his fowling piece for a little wingshooting—by pouring molten lead through a sievelike gadget that looks like one of your wife's frying pans and dropping it down a shaft to give it time to cool and

Copyrighted material



Atop the 167-foot shot tower, where lead pigs are melted at 700° F., molten metal pours through holes in shot-forming pan, emerging as round pellets already beginning to harden.

Copyrighted material



"Leaden rain" drops 133 feet down a shaft to lower floor of tower, is caught in a tank of water that cushions its fall.

Perfectly round shot roll over these tilted glass plates fast enough to skip a gutter that traps lopsided ones for remaking.

harden. Today, however, the ingredients and subsequent steps are precisely and scientifically controlled.

Tower supervisor Arthur Hiertz—a keen-eyed Remington veteran who's been on the job here 41 years—explains that the proper proportions for chilled (hardened) shot are approximately 95 percent lead, four percent antimony and one percent arsenic. The antimony does the hardening and the arsenic gives the mixture the right surface tension.

The rough shot is screened for roundness, sorted for size, and polished by whirling it in drums containing graphite. Then it's stored in vats ready for use. They make around 532,000,000 shot here in one day.

Machines Are Almost Human

Meanwhile, in another building, the paper body, the brass head, the five parts of the primer, and the wads and powder are being prepared for assembly into the shell.

The base wad is punched into the body and the brass head fitted on. The primer—the shell's "spark plug"—is assembled (a touchy business because of the highly explosive priming mixture) and inserted. Now the partially completed shell goes to the loading machine—a complex tribute to man's mechanical genius—which in one series of operations measures and pours in the powder, adds the filler wads, weighs and feeds in the shot, crimps the open end of the body into a six-way star, irons it flat and seals the shell with a nylon-waterproofed paper disk.

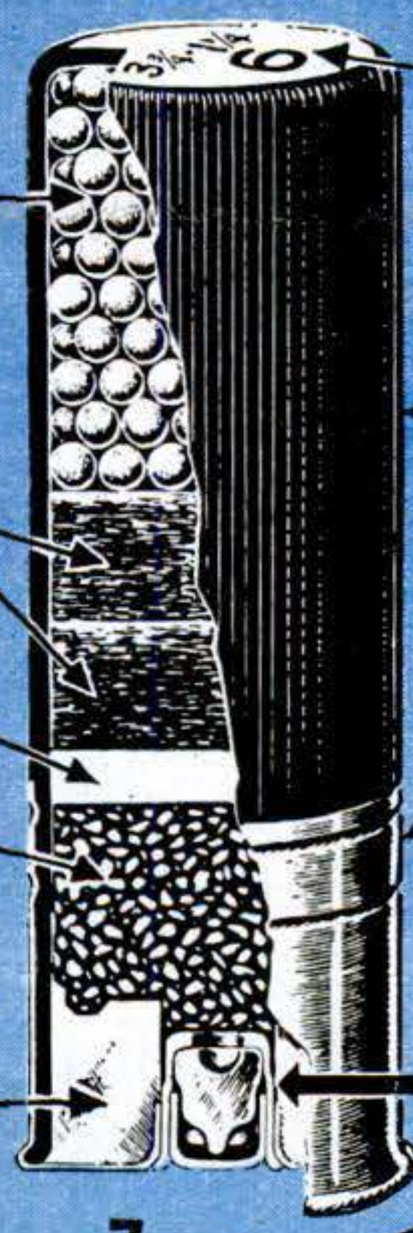
Shells Get Rough Treatment

All through manufacture, the shells are under close scrutiny, both visual and mechanical. Heads are automatically measured by passing them under a height gauge; powder charge is checked by a plunger that probes into each shell and stops the machine if the load is off as much as five grains; samples of every lot of completed shells are cut open for loading inspection. And in Remington's ballistics division, shells are fired and tested under far stiffer conditions than they will ever encounter in the field.

That's why when you draw a bead on your favorite target, whether it's pheasant or partridge, canvasback or clay pigeon, you can count on your ammunition—sure as shooting!

Copyrighted material

ENLARGED CROSS SECTION OF 12-GAUGE SHOTGUN SHELL SHOWS ITS 14 COMPONENTS



1 **Shot pellets,** made as round as possible to insure straight trajectory.

2, 3 **Felt filler wads** keep power behind shot to deliver maximum blow.

4 **Over-powder wad**—a disk of cardboard ⅛-inch thick.

5 **Progressive-burning powder** builds up power along gun barrel until charge has left muzzle.

6 **Base wad,** a tightly-wound strip of paper, strengthens head and primer.

7 **Primer cup** holds non-corrosive priming mixture.

8 **Priming mixture** ignites shell.

9 **Paper disk** is lid on top of priming mixture.

10 **Anvil** sets off priming mixture.

11 **Battery cup** holds primer together.

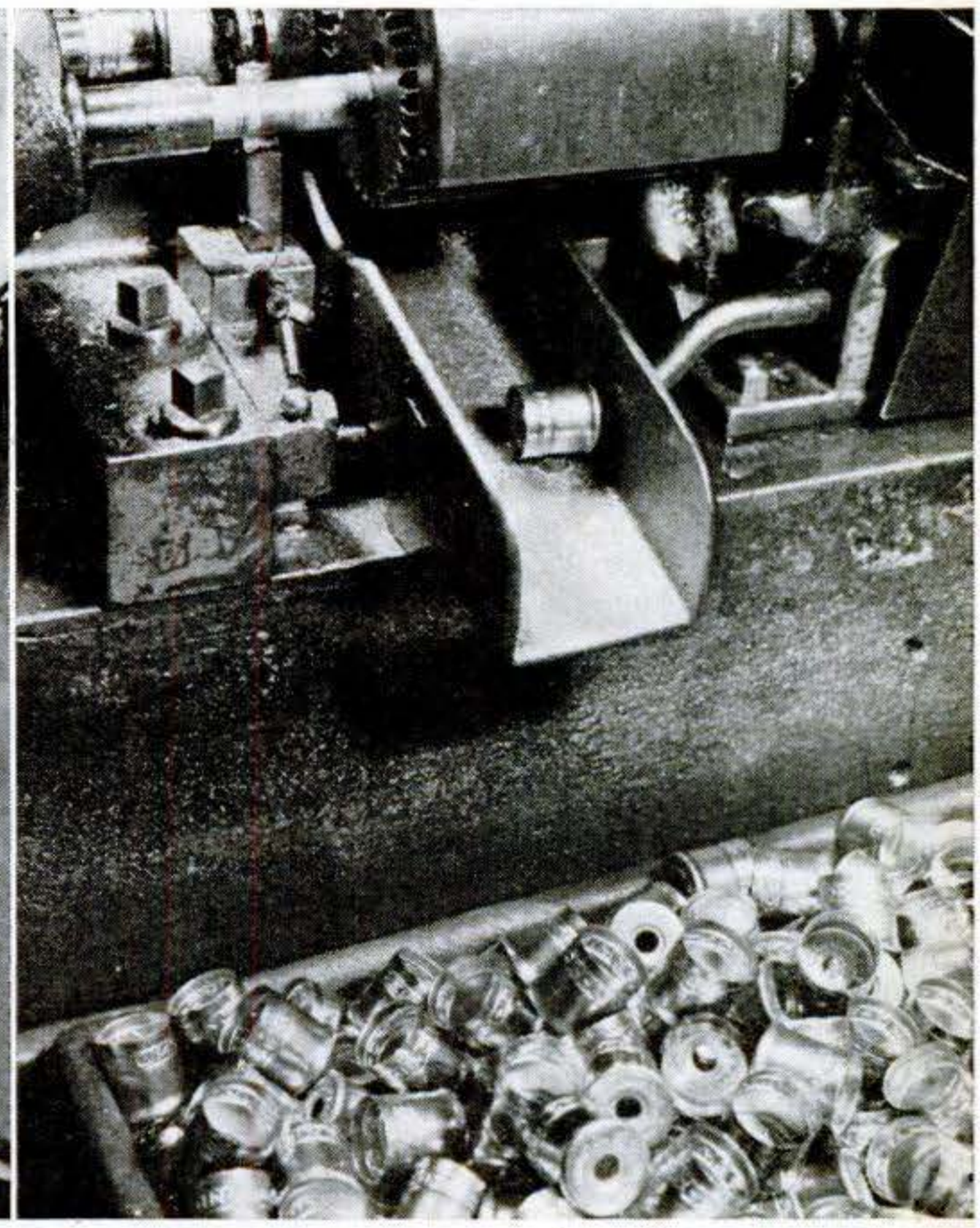
12 **Brass shell head,** annealed to prevent brittleness.

13 **Paper body** of shell, corrugated for smoother loading and extraction.

14 **Thin, waterproofed paper seal** eliminates old "top wad" which often got in way of shot as it left gun, spoiling pattern. Seal also gives load and shot size information.

Term "gauge" for size of shotgun shell goes back to time when the diameter of a one-pound ball of lead was one-gauge. Thus, diameter of 12-gauge shell (shown enlarged above) is same as that of one of balls formed by dividing pound of lead into 12 equal spheres.

Blanks for shell heads are punched out of a roll of brass and formed into cups. Next steps in processing are trimming, polishing, flanging and embossing.



Brass head comes out of embossing machine all finished except for final trimming of flange. Then it's ready to be fitted onto shell body.

(Continued on next page)

Copyrighted material

Paper for shell bodies is cut, stamped with Remington imprint, rolled and pasted into long tubes. Razor-sharp disks in cutting machine slice tubes into five body lengths.

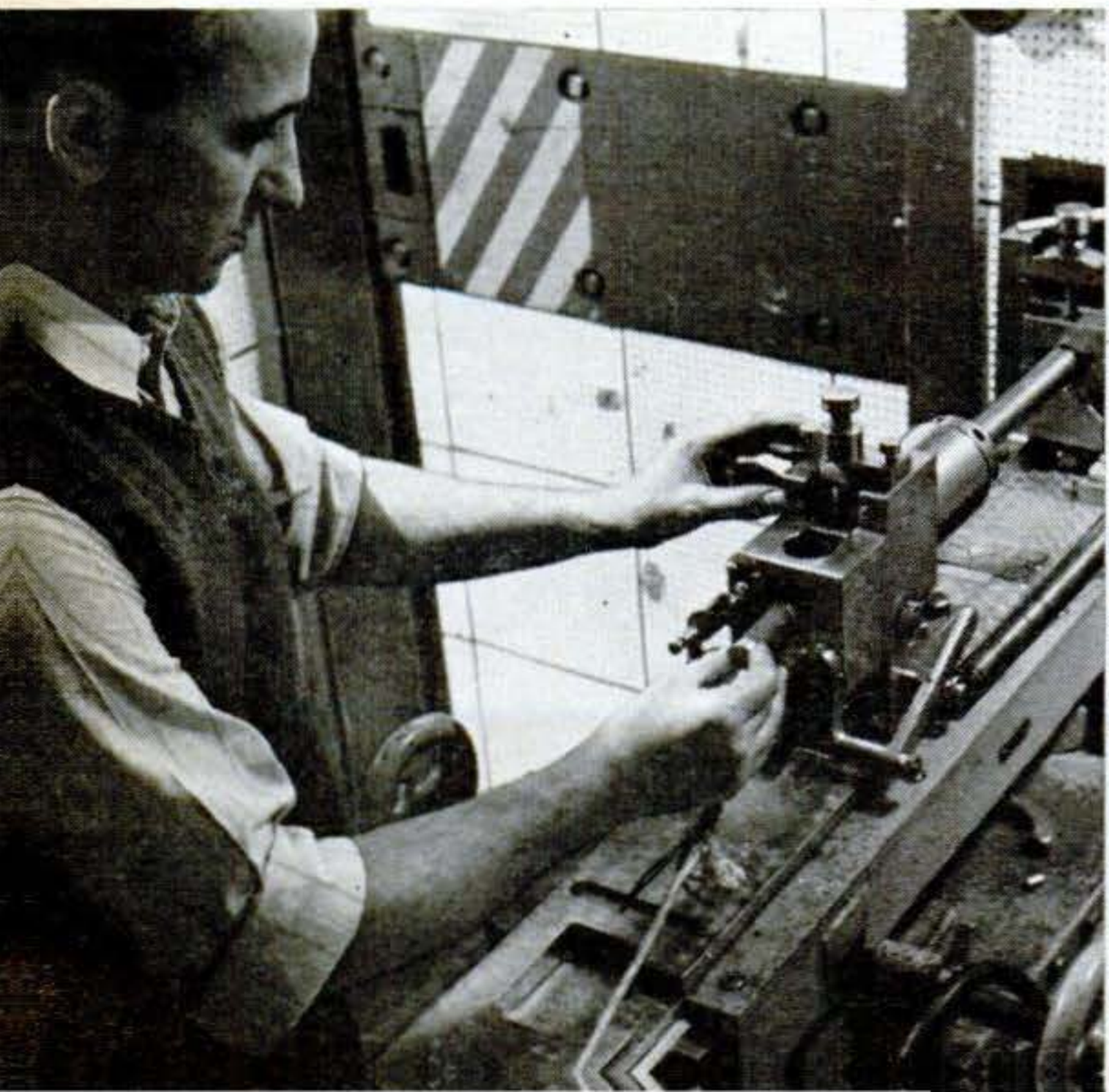
These are the tiny primer cups, which are punched and processed much like the brass shell heads. They hold the priming mixture which explodes on impact of firing pin.

Two filler wads of felt go into each shell on top of cardboard over-powder wad. The springy felt acts as a piston, pushing shot out of gun barrel when shell is fired.

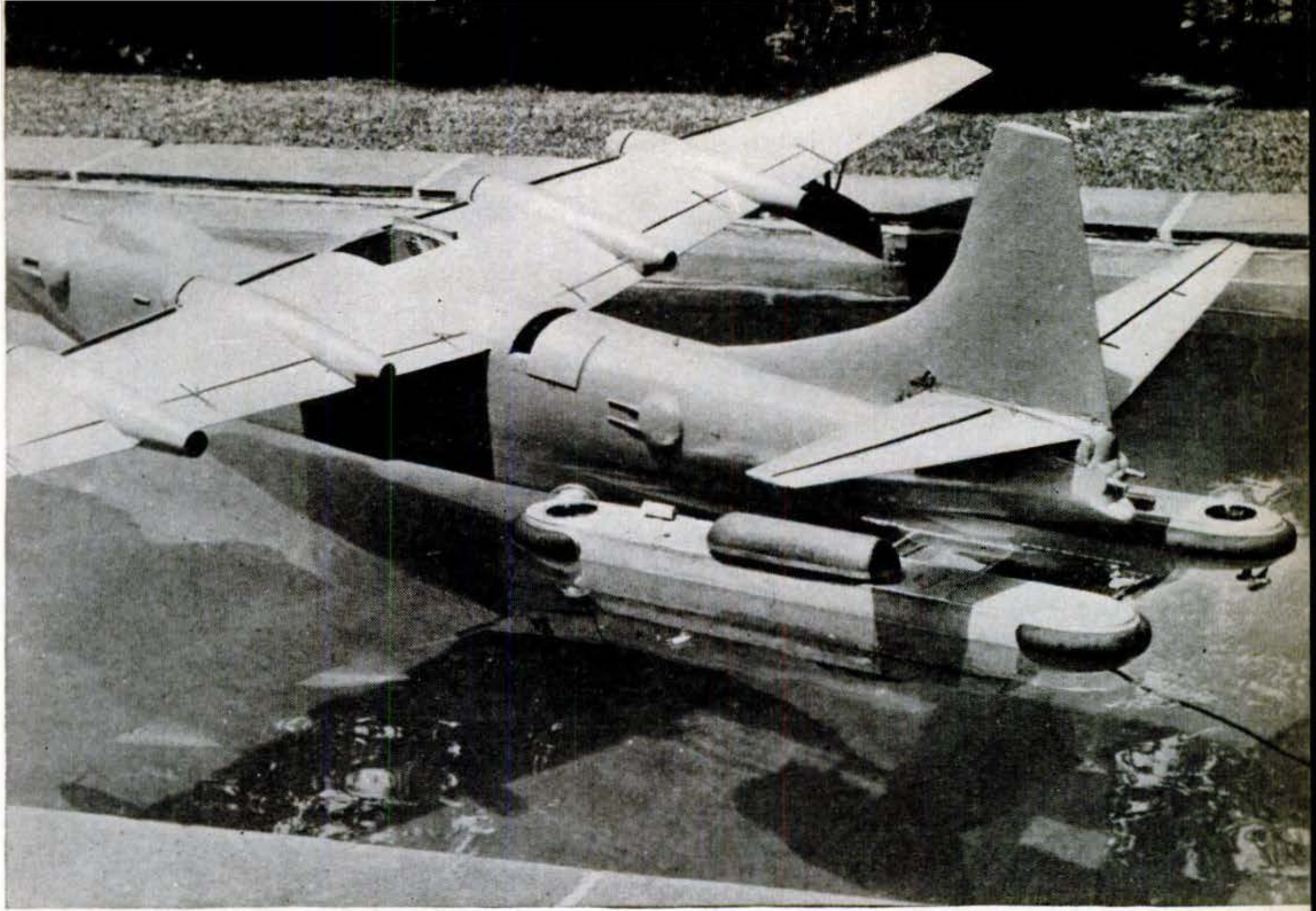
It's done with mirrors. Inspectors examine bodies, heads and primers—inside and out—as partially assembled shells pass along a conveyor system.

In ballistics lab, shells are fired on fixed "guns" to check velocity and function. Pattern is rated by counting number of pellets hitting 30-inch circle.

Last stop. Final inspection and packing ends series of 212 operations. It all leads up to Operation 213—that split-second when the hunter squeezes the trigger!



ghted material

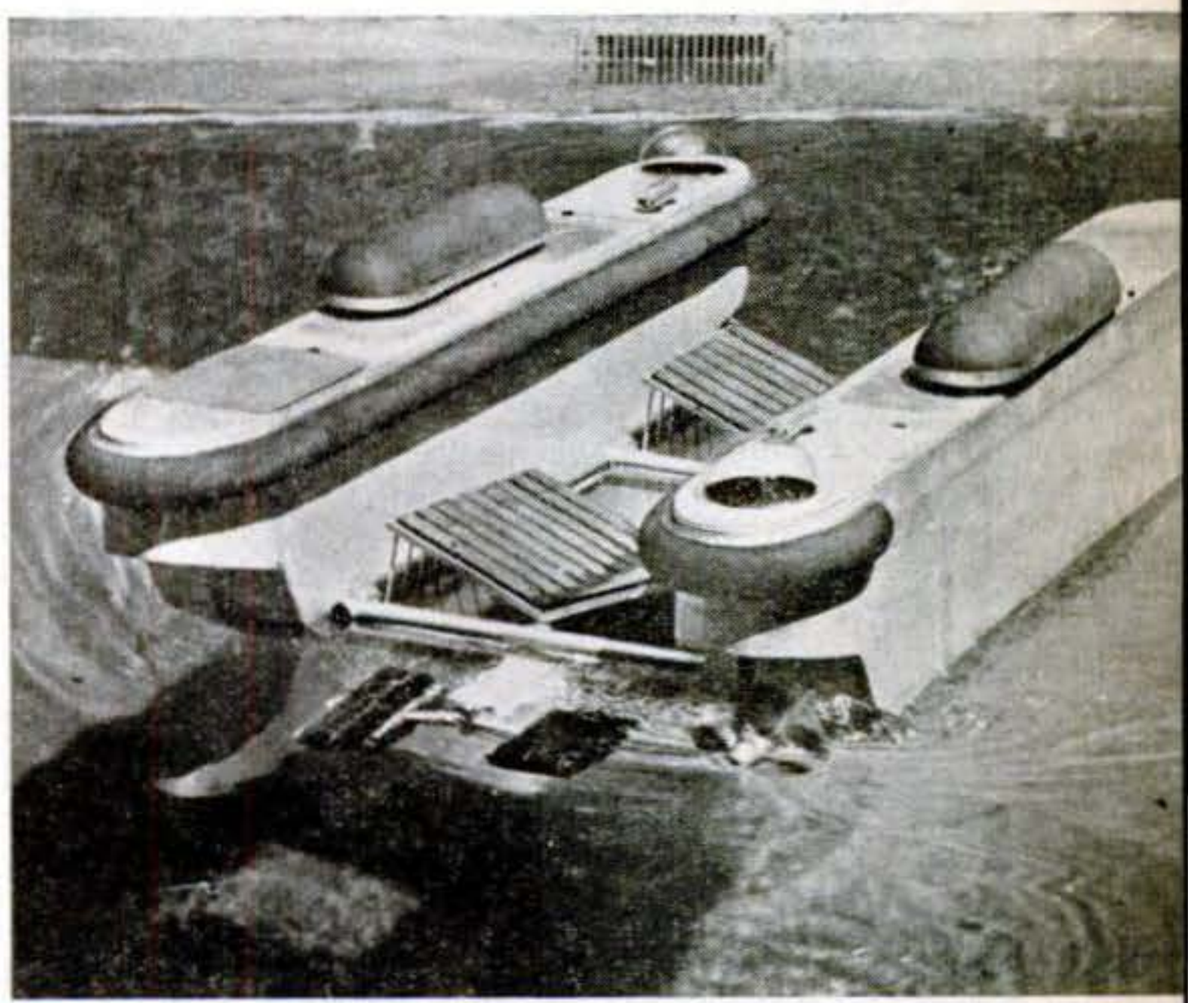


Twin flotation chambers are flooded so dock can move in under plane. Pneumatic bumpers protect flying boat from damage at all points of contact. Hull rests on removable pallet.

Dock Walks Off with Seaplanes

A SEAPLANE dry dock that can submerge itself, move backward, forward or sideways, and crawl up sandy beaches on tractor treads promises to simplify the tricky handling of giant flying boats.

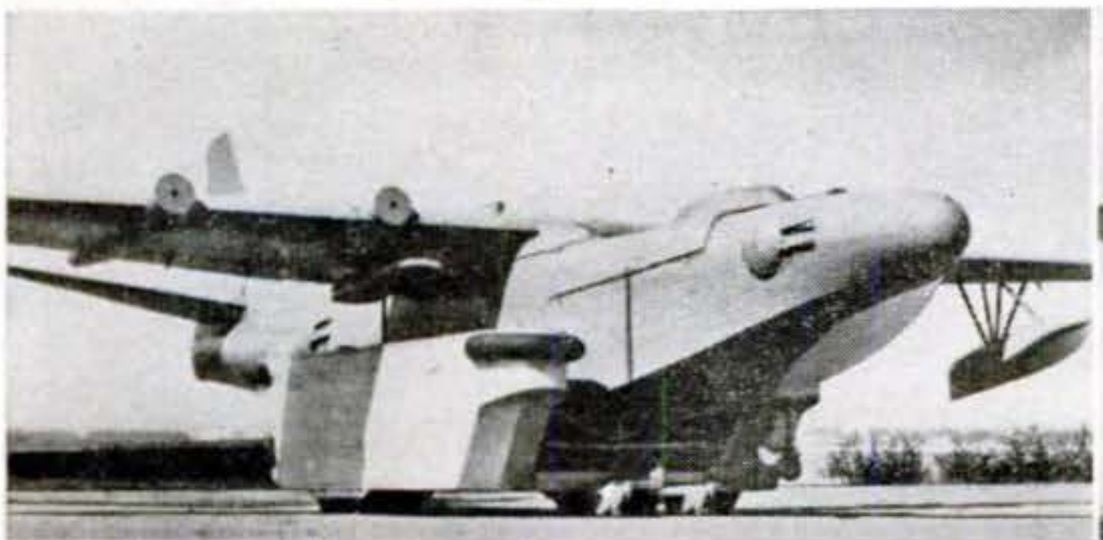
Each of the two pontoon-like floats has a propeller—mounted at the opposite end from the other—that can turn through 360 degrees to give complete maneuverability. There are three tractor treads mounted in tricycle fashion, and two control stations, either of which can operate the Edo Corp. unit. These photos, made with scale models, show how the dock would beach a P5Y, Convair's fast new turboprop seaplane.



Floating dock has two propellers and three tractor treads to give land-or-sea maneuverability. At diagonally opposite ends of flotation chambers are cockpits for helmsmen.

As helmsman approaches shore, he transfers power from propellers to caterpillar treads. One of two large pneumatic cushions can be seen raised under wing to support it.

V-shaped removable pallet on which hull rests is transferred on its wheeled gear to an unloading platform. In actual operations, this would be done by means of winch or tractor.



P.S.

Last minute news & notes...

ABOUT 2,500 NEW RADIO HAMS qualified for licenses in the first five weeks after the FCC lowered requirements for new amateur operators. Most of the applications came under the Amateur Novice Class that was set up to help beginners get on the air more quickly. Applicants need only pass a simplified examination and a five-word-a-minute code test. Novice licenses are good for one year and are not renewable.

GAMMA RAYS from a $7,000-an-ounce metal--thulium, one of the rare-earth elements--are being used in England for X-ray-type pictures of aluminum castings. Irradiated in an atomic furnace, thulium gives off rays of just the right length. Most rays are too penetrating.

NEWEST GLOBAL BOMBER, eight-jet version of the B-36, is expected to make its first test flight late next month. This swept-wing YB-60 will be powered by eight Pratt and Whitney J-57s, each developing 10,000 pounds of thrust . . . BRITISH claim their latest jet fighter, the Hawker P-1067, is the fastest in the world, superior to both the F-86 and the MiG-15.

FIRST PLANE designed to act as a tanker aircraft, troop transport, cargo carrier or hospital plane has been delivered to the Air Force. Called the KC-97E, it's the newest modification of Boeing's Stratofreighter . . . NEW HYDRAULIC FLUID for the Navy can be spurted into the flame of an oxyacetylene torch without catching fire. Called H-2, it's made by R. M. Hollingshead Corp. Flammable fluids have caused several air accidents.

LOOK for one of the major automobile producers to announce a gas-turbine bus in the next couple of years. It's in the works. Popular Science forecast just such a development a year ago last summer (PS, June '50, p. 98) . . . GENERAL MOTORS may follow Chrysler in using power steering on passenger cars. Detroit reports say it will be on some 1952 GM models. . . . TINTED WINDSHIELDS can be added to any car by applying a colored-plastic filter strip. It sticks to the glass by itself. Filterzone Auto-Vision Co., Brooklyn, makes it.

COAST-TO-COAST TV became a reality last month when the Bell System completed its transcontinental microwave network in time to put the Japanese peace-treaty negotiations on the first nation-wide television hook-up.

UHF TELEVISION is still a year or two off, but sets built to receive the new channels have arrived. All models in the new Motorola line will be available with built-in UHF tuners. Opening of the ultra-high frequencies to commercial telecasting is expected to add some 70 new channels to the present 12 VHF (very-high-frequency) bands, making possible more and better distributed TV services.

THE NAVY may be planning to atom-bomb a submarine. It has asked Congress to let it use a partly finished submarine as a target for "underwater explosions."

DIESEL FUEL made from oil shale at Rifle, Colo., (PS, Feb. '49 p. 130) has come through a use test with flying colors.

THREE SYNTHETIC pain killers may help the fight against drug addiction. Demerol, methadon and dromoran do morphine's work, but don't give the "kick" to addicts, and are easier to control, being factory-made . . . NEWS on synthetic cortisone is breaking fast. Latest: Merck & Co., Inc. says it can make it from substances found in such abundant materials as yeast, Mexican yams, soy beans, cattle spines and wool fat. After process is perfected, it will mean more cortisone.

The Editors

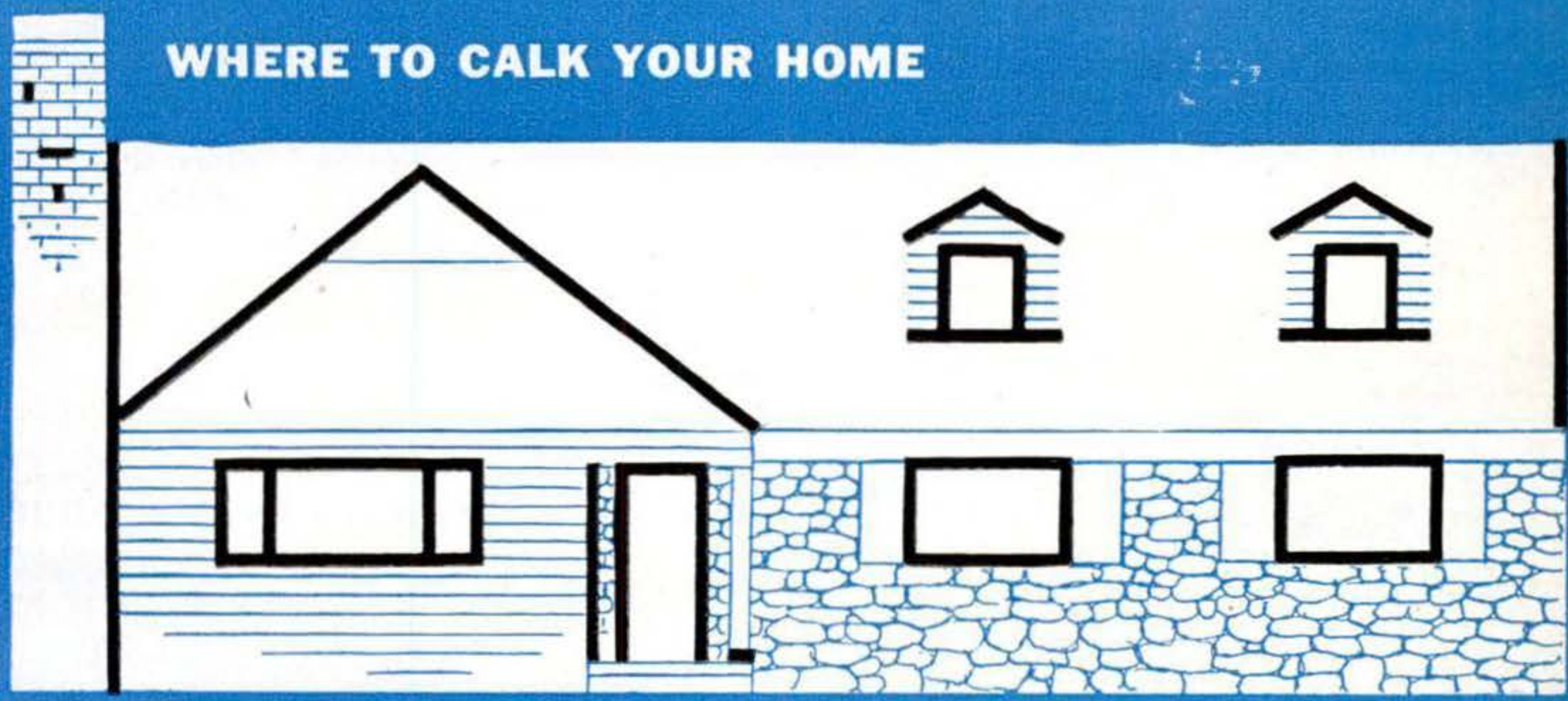
Copyrighted material

MECHANICS
and
HANDICRAFT
REG. U. S. PAT. OFF.

Winterizing Your Home

Wrapping up your home tightly for the cold months ahead is easy, and it costs little when you do it yourself.

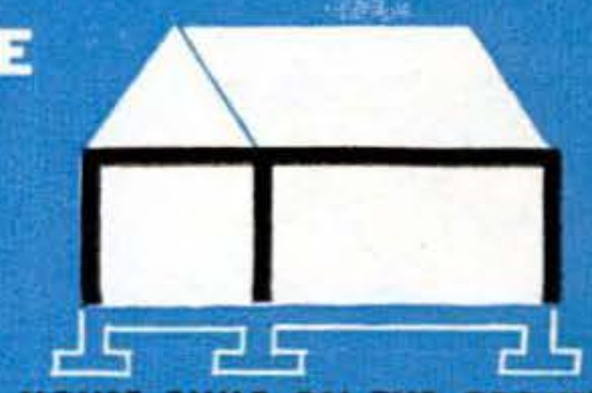
WHERE TO CALK YOUR HOME



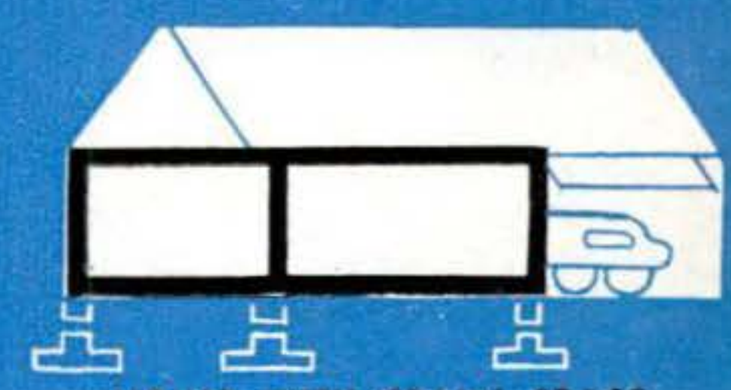
WHERE TO INSULATE YOUR HOME

By Denis Sneigr

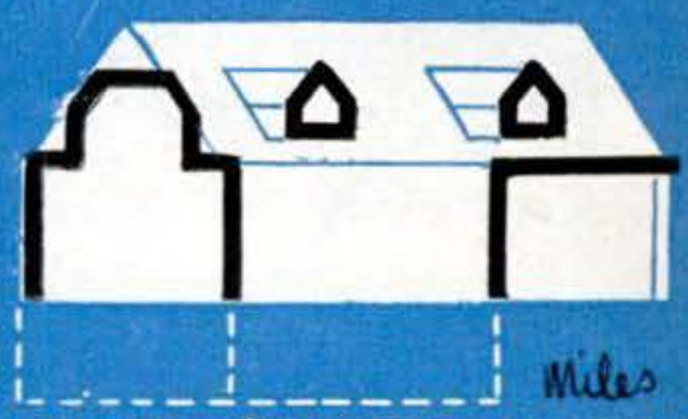
COME winter when Grandpa was a boy, he'd haul out the long johns and woolen shirts. He needed them, for often the only warmth in the house was around the kitchen stove—and that just made the cold drafts from doors and windows more noticeable. Today we expect even the baby to wear nothing warmer than a diaper while playing in front of the picture window. Your house, whether it's new or old, can be that cozy. All kinds of materials—most so easy to apply that your wife can help—are now available to fill the cracks, stop drafts and keep the furnace heat in (and summer heat out). They cost little, and over the years pay back a big dividend both in comfort and actual fuel dollars saved.



HOUSE BUILT ON THE GROUND
(UNUSED ATTIC)



HOUSE WITH CRAWL SPACE
(UNUSED ATTIC, UNHEATED GARAGE)



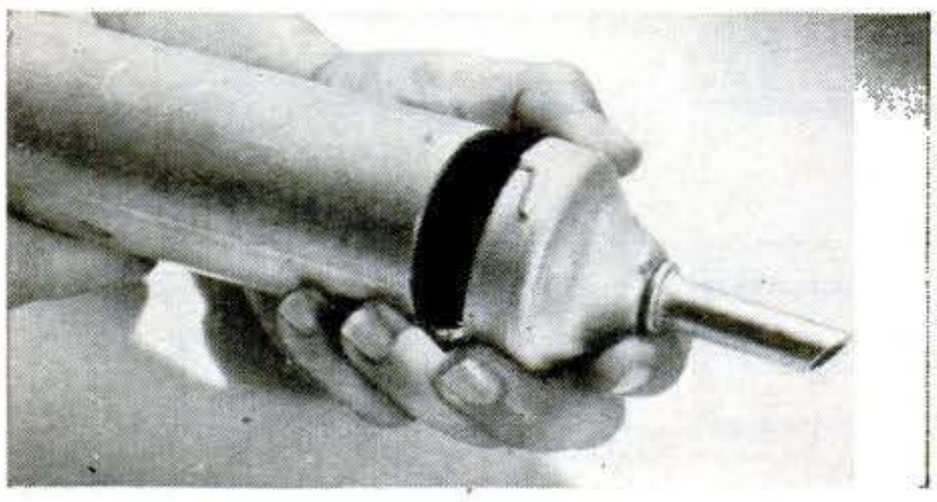
HOUSE WITH BASEMENT, AND LIVING QUARTERS ON SECOND FLOOR
(UNHEATED GARAGE)

Turn the page to see how you can winterproof your home

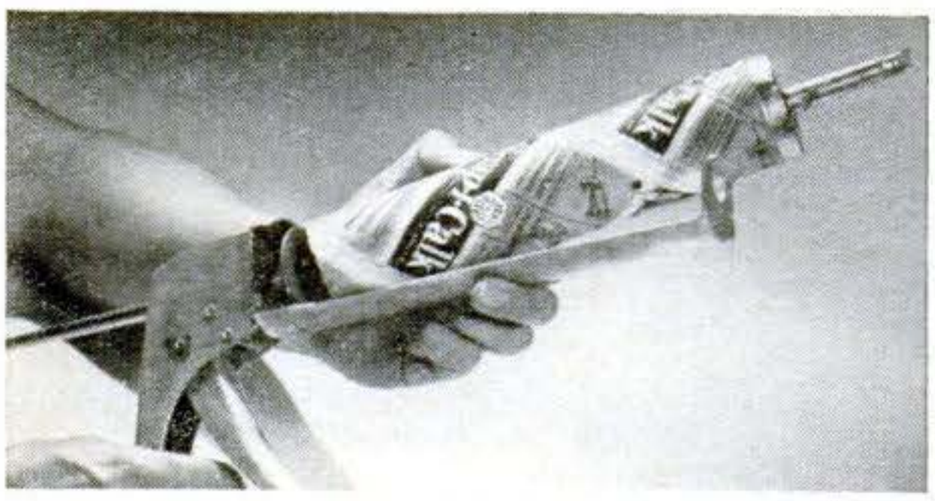
CALKING Keeps Heat in and the Dampness Out

Tools like these make the job easy for you

Interchangeable-nozzle gun has tips of different sizes and shapes for different jobs. The gun can be completely disassembled, which makes cleaning it easy.



Less expensive type has cap that is secured to the barrel by a twist lock instead of by threads. It comes with only one nozzle that is part of cap.



Cartridge gun is probably the easiest of all to load. Barrel, nozzle and cartridge are one disposable unit. When the barrel is empty, you throw it away.

Calking compound also comes in tubes like toothpaste. The applicator nozzle is a part of the tube. To use the tube, you turn key to squeeze out compound.

ALMOST every homeowner faithfully puts up storm windows and doors when the leaves begin to fall. That's smart business —keeps heat in the house and cuts the fuel bill. But many homeowners forget to calk around those same window and door frames, forgetting that they can lose lots of heat through gaps between the wall and the trim.

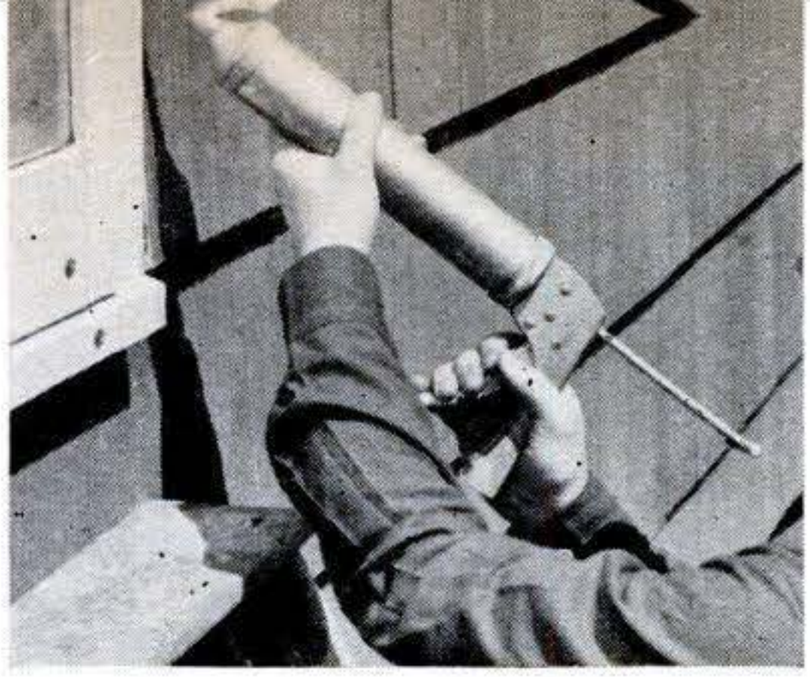
Calking compound is an elastic material of a putty-like consistency. It is used to fill seams, cracks and joints in wood, masonry, metal, glass or any combination of those materials.

You can buy it in several colors, the most common being white, gray and black. The white and gray are oil-base compounds, and you should use them where you want to paint over them. The black kind has an asphaltum base. Don't paint over it, because the asphaltum will often bleed

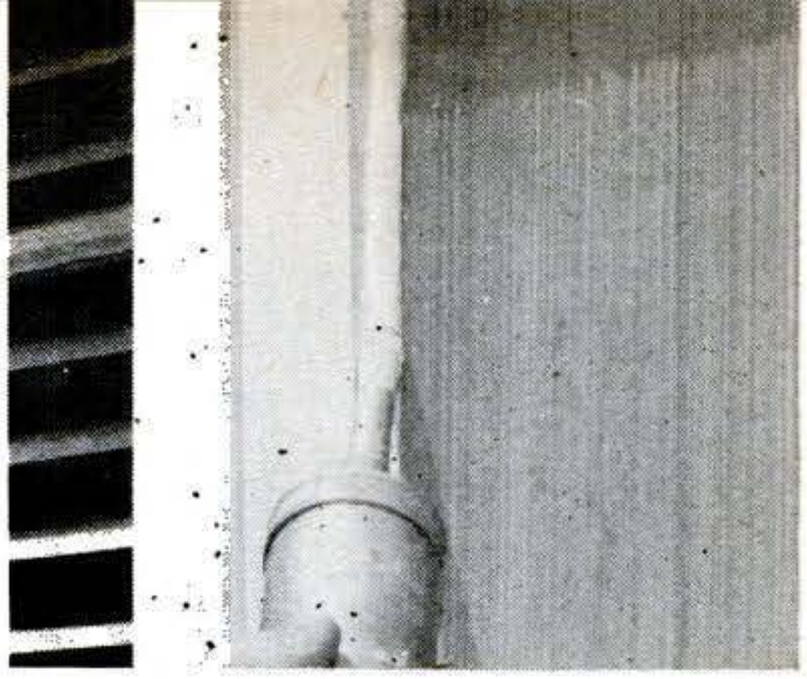
Here are the ways to use your

Black, asphaltum-base calking compound is best for chimney and roof flashings. Use the same kind of calking around vent pipes on roof.

Leaks often develop where shingles overhang the edge of the roof. Run a bead of black asphaltum-base compound all along such edges.



Tips of nozzles are beveled. Use this angle of the bevel as your guide (left) and hold gun so bevel is parallel to the line of the joint. Best kind of calking bead is a little convex (right) on the surface. Convex bead allows for shrinkage and prevents early cracking.



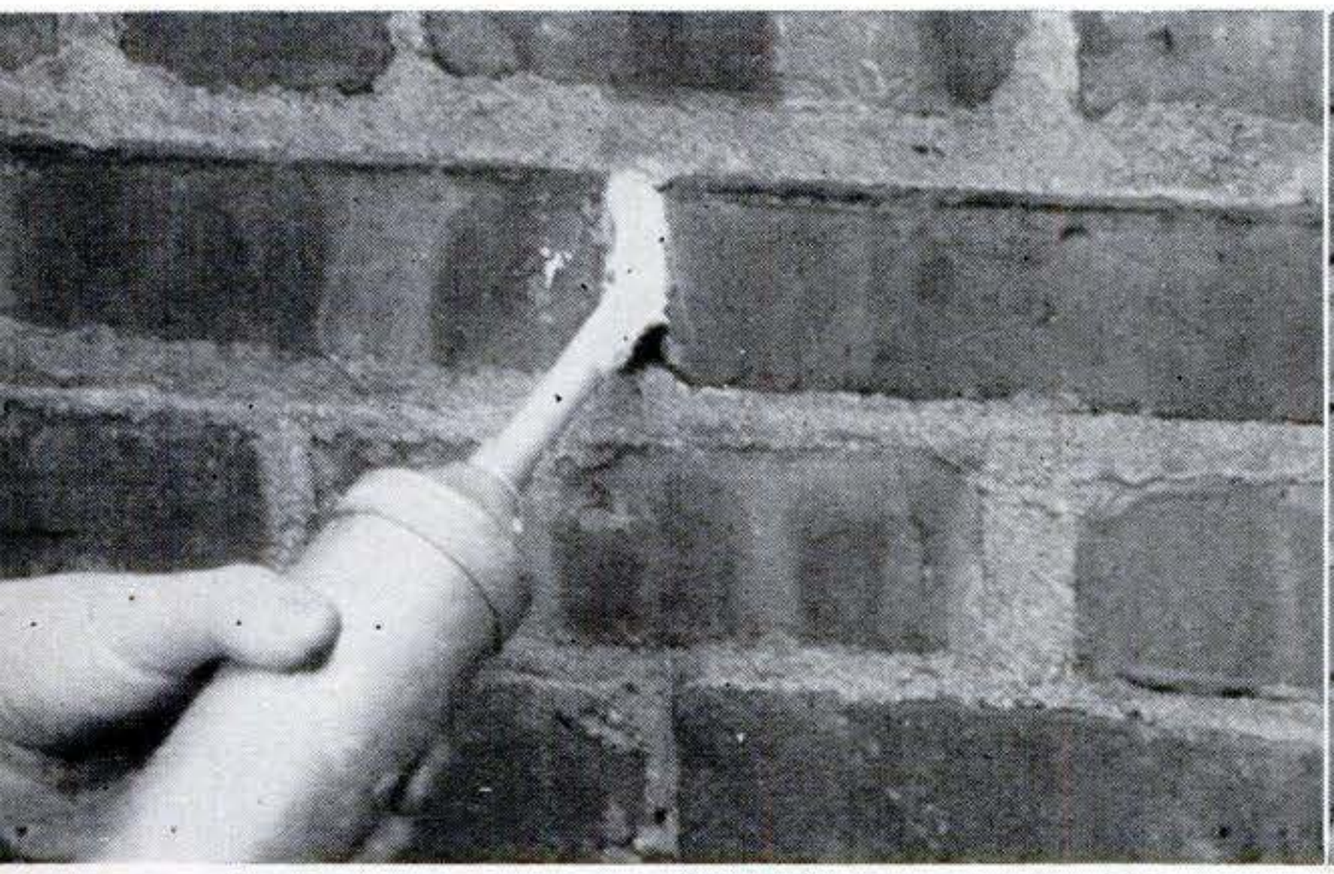
through the paint. The oil-base compound won't bleed through.

Calking compounds usually are sold in two grades—gun grade and knife grade. The gun grade is most common and is especially made for application with a calking gun. The knife grade is stiffer and is designed for application with a putty knife or small trowel. It is used for many jobs where the softer gun grade would not be suitable. It makes an excellent glazing compound—more elastic and more permanent than putty. And if you use it rather than putty to fill cracks or nail holes in siding or trim, it will not crack out as the wood expands and contracts. Since it dries harder than the gun grade it is ideal for filling seams in exposed wooden floors—such as porch floors.

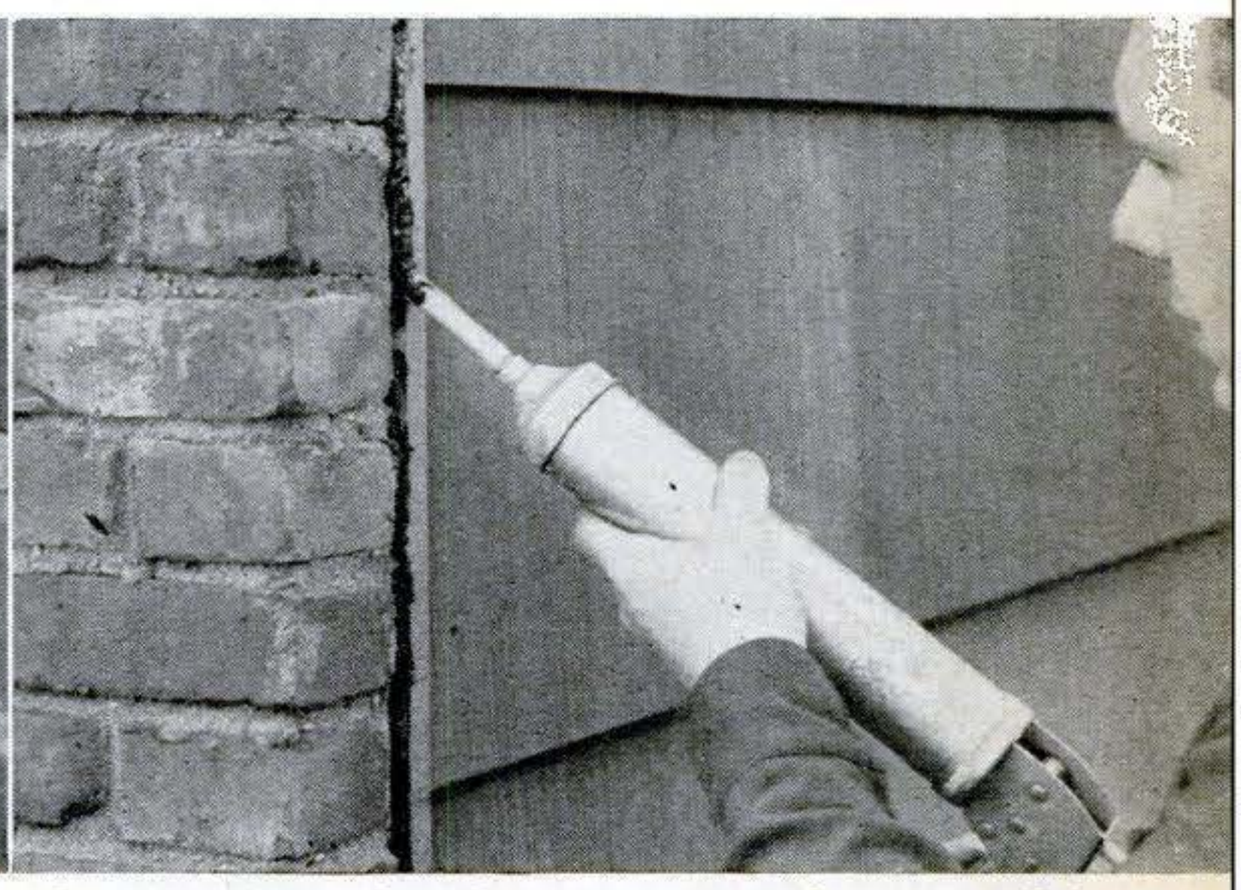
Calking guns vary considerably but work on the same principle. A plunger on the end of a rod rides in the barrel. A ratchet on one side of the rod is engaged by a pawl on the trigger. Pulling the trigger forces the rod and plunger into the barrel, squeezing compound out of the nozzle.

Regardless of the type of gun you use, the basic techniques are the same. Pick a warm, dry day. Don't calk when the tem-

gun at six important places that often need calking



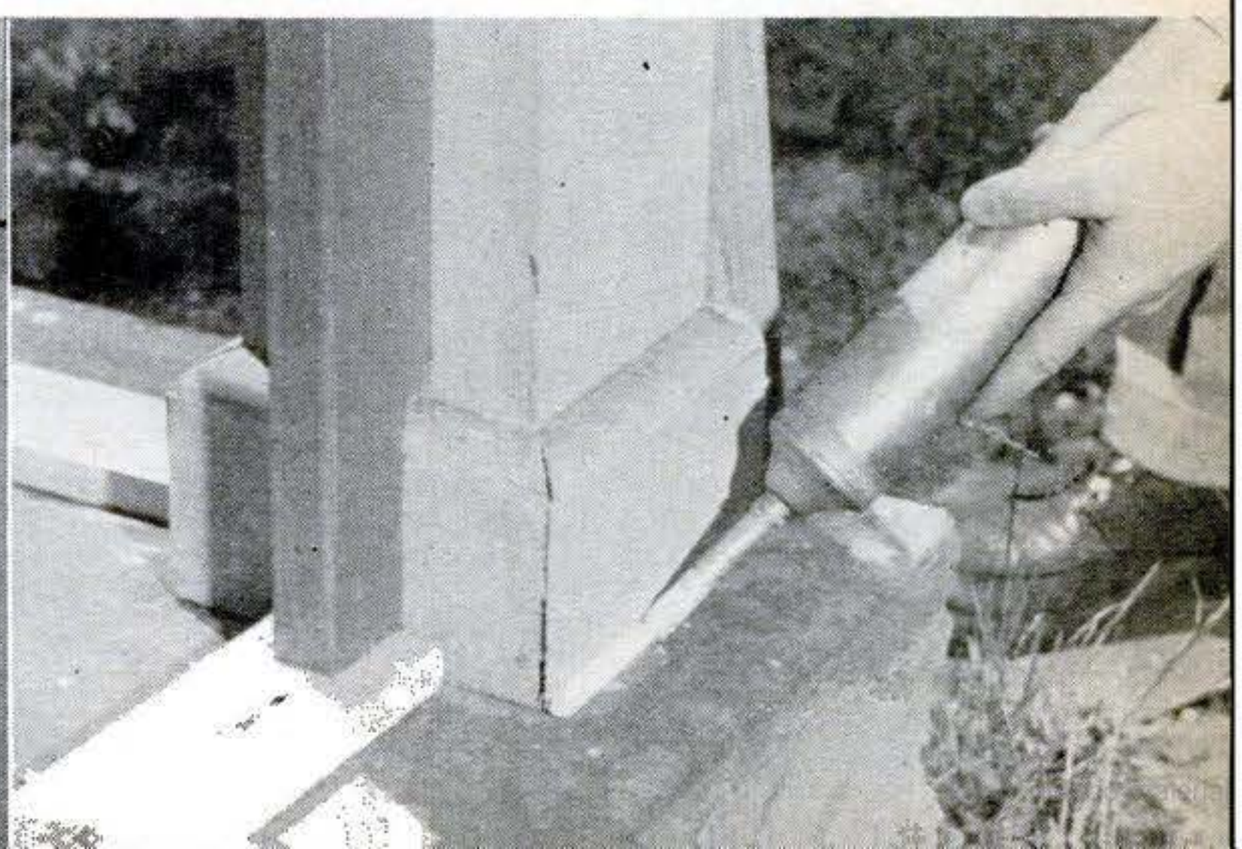
Scrape out mortar that is loose or crumbling in masonry joints. Dust joint with a brush and pump in a load of calking compound.

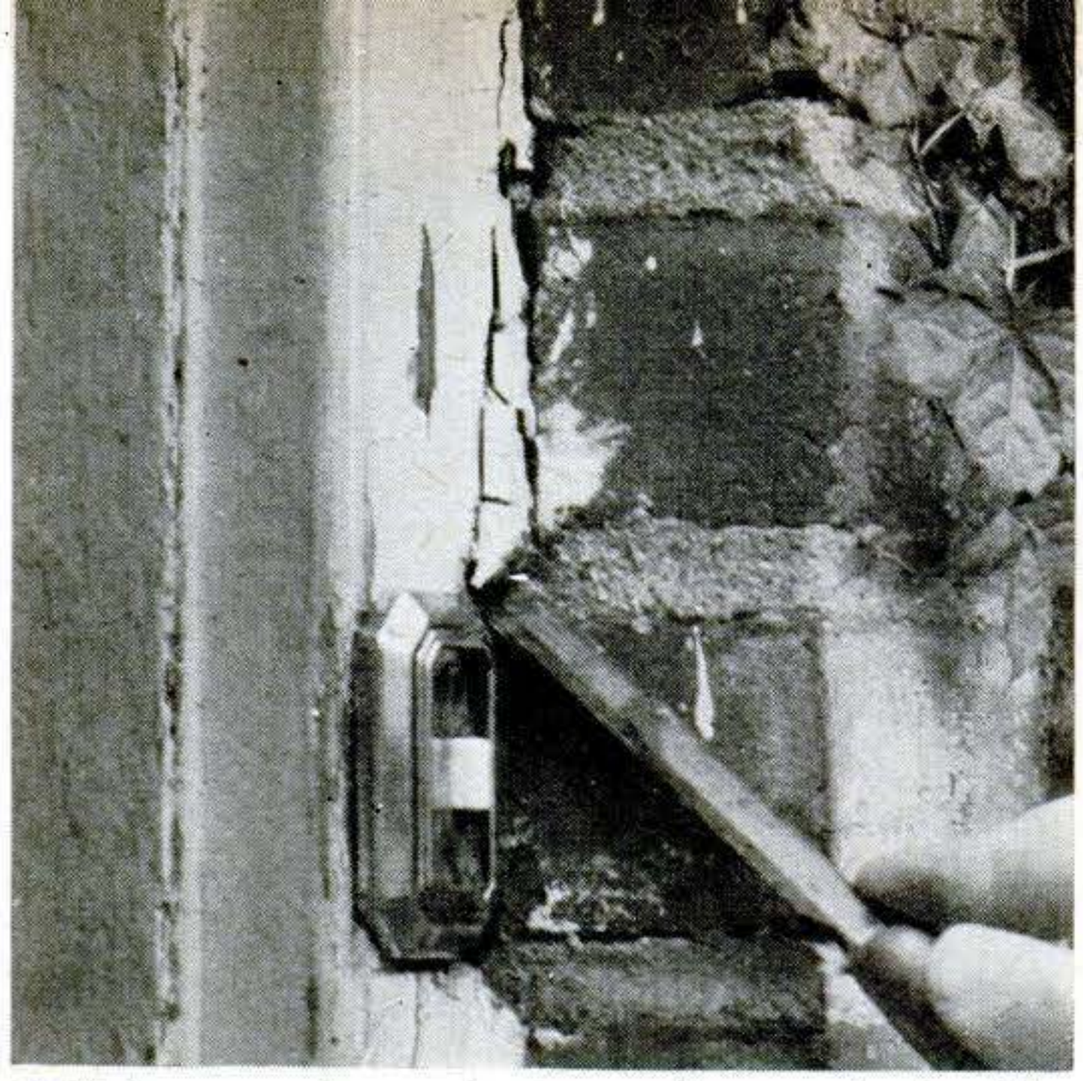


Cracks often develop at points where two different types of exterior finish meet. If not calked, water may seep in behind the walls.

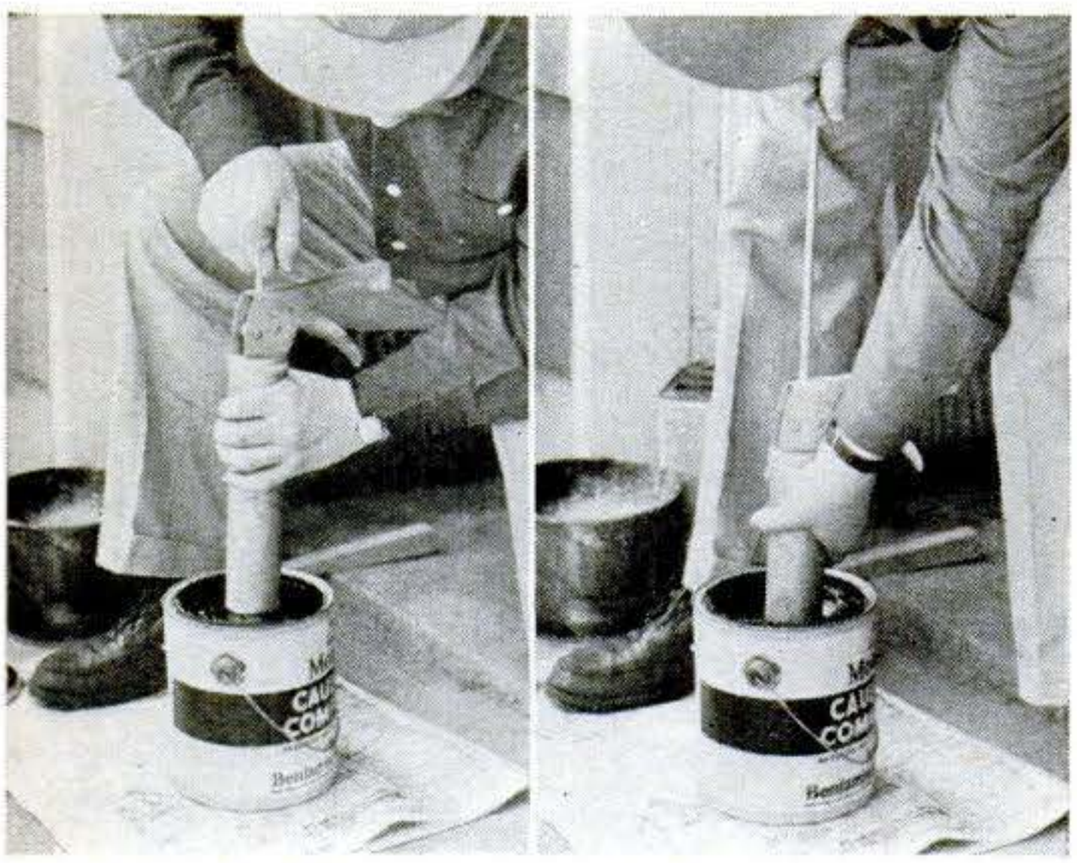
Calking around door frames should be carried down to the stoop. Then run calking along the joint where the stoop meets the house.

Joints where wooden columns meet masonry floors or walls should be calked to keep out water that eventually will rot the wood.





Calking needs replacing when it looks like this. Scrape out all calking that is cracked, crumbling or loose. Old chisel is good tool.



Loading bulk compound. Remove cap and nozzle. Push plunger all the way into barrel. Put end of barrel in compound (left). Pull back on plunger (right) letting gun down into can as compound is sucked into barrel. Wipe off excess compound from outside of barrel.

To clean gun, run out all remaining compound and wash gun with solvent. An old paintbrush will help you wash plunger and threads.

perature is lower than 55° F. or when the surface is the least bit damp. When the temperature is too low, the compound becomes too stiff to work properly. It won't dry and hold as it should.

When painting your house you can calk at the same time. You don't have to wait for calking compound to dry before painting over it. If you are doing a two-coat job, apply the first coat of paint. Let it dry, calk, and then go ahead with the finish coat. It's best not to calk over raw wood. Prime it first.

How to calk. If you find loading bulk compound is a messy job, use a calking cartridge. This is a cellophane tube with compound inside. You drop it in the barrel and snip the end off with scissors.

You'll notice that nozzles of the guns are beveled. Hold the gun so the angle of the bevel is parallel with the joint to be calked.

Pump the trigger once or twice until compound starts to ooze out of the nozzle. Move the gun slowly and steadily along the joint, squeezing the trigger as you go. As the ratchet clicks, release the trigger and start the slow, steady pressure on the trigger again. Keep the nozzle moving along evenly all the while.

Where to calk. Check around window and door frames and other openings. Scrape out all calking that is cracked, crumbling or loose. Remove calking that has shrunk so it is pulling away from the wall or frame. If you can slide a knife blade between calking and wall or frame, then the compound has started to pull away. After scraping out old calking, dust out the joint with an old paintbrush.

If old calking is sticking firmly at the sides but has started to crack down the center, then it is generally safe to re-calk over the old compound.

Windows and doors. Calk completely around window frames. Also fill any joints in the frames that may have opened. If you have steel casement windows, calk all around them too. Then go inside and seal the joint where the steel frame and the plaster meet. Use the smaller ¼" round nozzle or the pinched nozzle for the inside job.

Around door frames, carry the calking down to the spot where the frame meets the stoop. Also calk wherever a stoop, porch floor or sidewalk meets the house.

Exterior walls. If these walls are wood siding, fill all cracks and seams, using the

Copyrighted material

smaller round tip. If the walls are brick, fieldstone, stucco or other masonry, use the ½" round tip. Scrape out loose or cracked mortar and replace it with calking compound. Water that seeps into masonry joints may freeze and crack the masonry.

Roofing and flashings. Reload your gun with black, asphaltum-base compound for calking the roof. The black compound is best for roof jobs because it stands up better under exposure to the sun than the white or gray compound.

Check around all chimney flashings, calking where necessary between the metal and the brick work and between the metal and the roof. Other spots on the roof that may need calking are around vent pipes and along the flashings in valleys. Also run a bead along the eaves where the shingles overhang.

Wherever you have to fill wide joints—such as on a flat roof covered with roofing felt—use a putty knife or trowel to apply the black compound.

Cleaning the gun. Run any remaining compound out of the gun. Then disassemble the gun and wash all parts in mineral spirits. Use a piece of wire to clean the tips. Make sure the threads on the barrel and cap are clean. An old paintbrush is handy for washing the threads and the end of the plunger. When the parts are clean, assemble them and wrap the gun in a cloth.

Plastic-base compound is made for filling cracks around bathtub, shower, sink, or joints in tile. No gun is needed. Just squeeze the tube.

While ordinary compound and a calking gun can be used to seal joints in tile and cracks around a bathtub, there is a plastic-base waterproof compound for this purpose now on the market. It comes in a tube and you apply it by squeezing the tube. It dries in four to six hours.

INSULATING Your Home for More Comfort

MOST houses built in recent years have been at least partly insulated. A lot of older ones haven't been insulated at all. The chances are that, unless you live in a new, lavishly built house, additional insulation will improve your home.

What to expect. Good insulation is like money in the savings bank: it pays a regular interest in unconsumed fuel. How much it pays is tough to figure in advance, depending as it does on a lot of variables. You should be realistic in estimating the probable savings. Don't total up five different advertising claims and expect the fuel bill to dwindle to the vanishing point, like the character who bought so many gas-saving gadgets he expected to bail out the tank of his car every ten miles.

However, here's what a full insulating job can do: A six-months' test was recently run in Belleville, N. J., on two identical two-story homes. One was fully insulated and the other only above the upper ceiling. Over the period of the test, it took 340 more gallons of fuel oil to heat the incompletely insulated one than it did the other. At 12 cents a gallon, that's a six-months' saving of $40.80.

Blowing it in. If the walls of your house weren't insulated when the house was built, and if you want to fill them, probably your best bet is to call in a professional. His crew will arrive with a truck, big blower, long hoses and bags of insulation. They will remove sections of siding, cut holes in the sheathing, blow in the insulation, and seal up the wall. If you have a lot of time and energy you might do the job yourself, but it is laborious and tricky. One problem is locating the fire stops, the short, transverse two-by-fours between studs. To do it right, you should cut a hole just under each fire stop, and this calls for a lot of sounding and probing.

Unless you are very ambitious, better not tackle a blowing-in job for an entire house. It isn't too hard, though, to do a limited area, say, a bathroom with one cold outside wall that makes the room a bit chilly for comfort. Insulation can be fed into wall holes with scoops bent up out of dustpans.

Don't forget that if you can couple the

Copyrighted material

You can install any of these kinds of insulation

Blanket: This is a fibrous material sandwiched between paper. Rolls are different lengths and widths. Among materials used are mineral wool, wood fibers and cotton.

Loose fill: Available as pellets of expanded mica (vermiculite) or as loose fibers. The latter may be slag wool, rock wool, glass wool or shredded redwood bark. You just pour it in place.

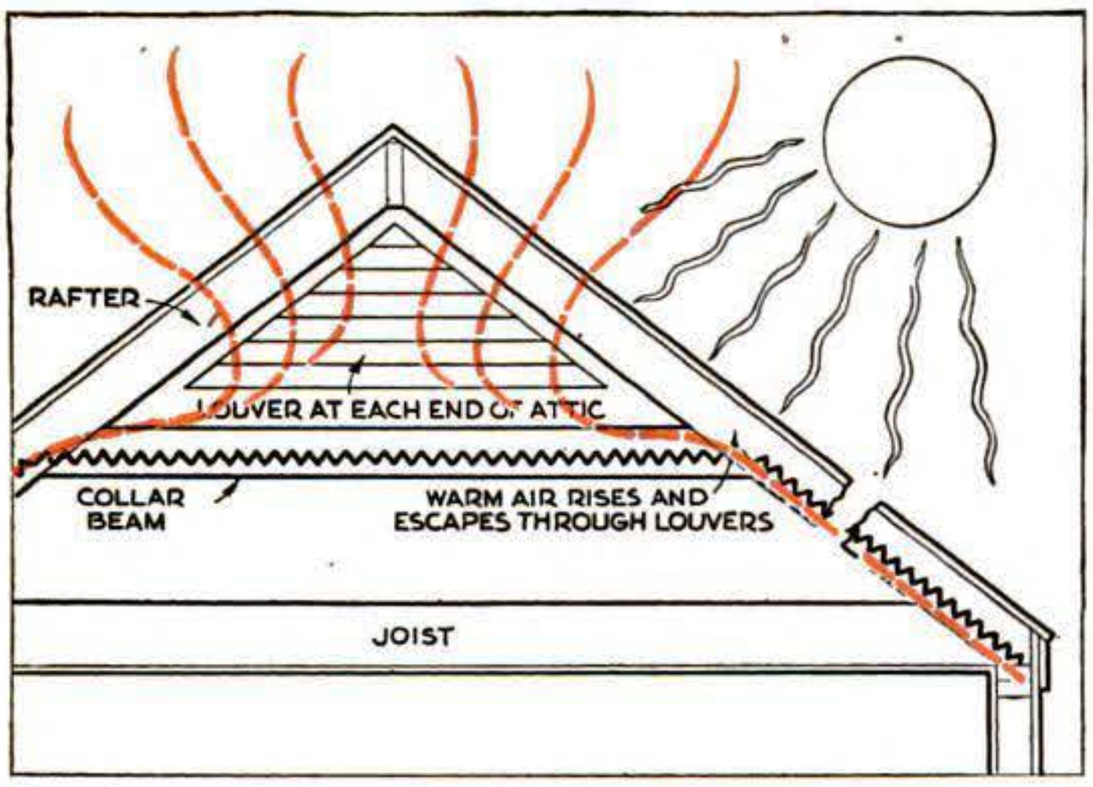
Insulating board: These rigid boards—some of them decorative—are made of vegetable or wood fibers. They often are used as finish walls and ceilings. The decorative ones are called tile and plank boards. Some are nailed in place. Others are put up with clips or special adhesive.

Reflective: This is a bright metal foil, usually aluminum. It comes in long lengths and is just wide enough to be stapled between studs, joists or rafters.

Batts: Similar to the blanket type, but in the form of pads that are just long enough to be handled easily and wide enough to fit between studs, rafters and joists. In some, the insulation is glued to a sheet of treated paper that acts as a vapor barrier. Others are enclosed between two sheets of paper, one of which is a vapor barrier. They can be stapled in place.

wall-insulating job with remodeling work, you can get inside the wall more conveniently. For instance, if an outside plastered wall is to be covered over with paneling or wallboard, it will be easier to forget the outside, siding-and-sheathing approach and just cut into the plaster at the ceiling and at the fire stops.

Insulating the attic. Here the job is much simpler, and unless you're very lazy, there's no need to call in a pro. About the only tools you need are your hands, and the only cost is that of the insulation itself.



Roof insulation keeps your home warmer in the winter and cooler in the summer. It keeps heat from escaping during the cold months. In summer, heated air flows away through louvers.

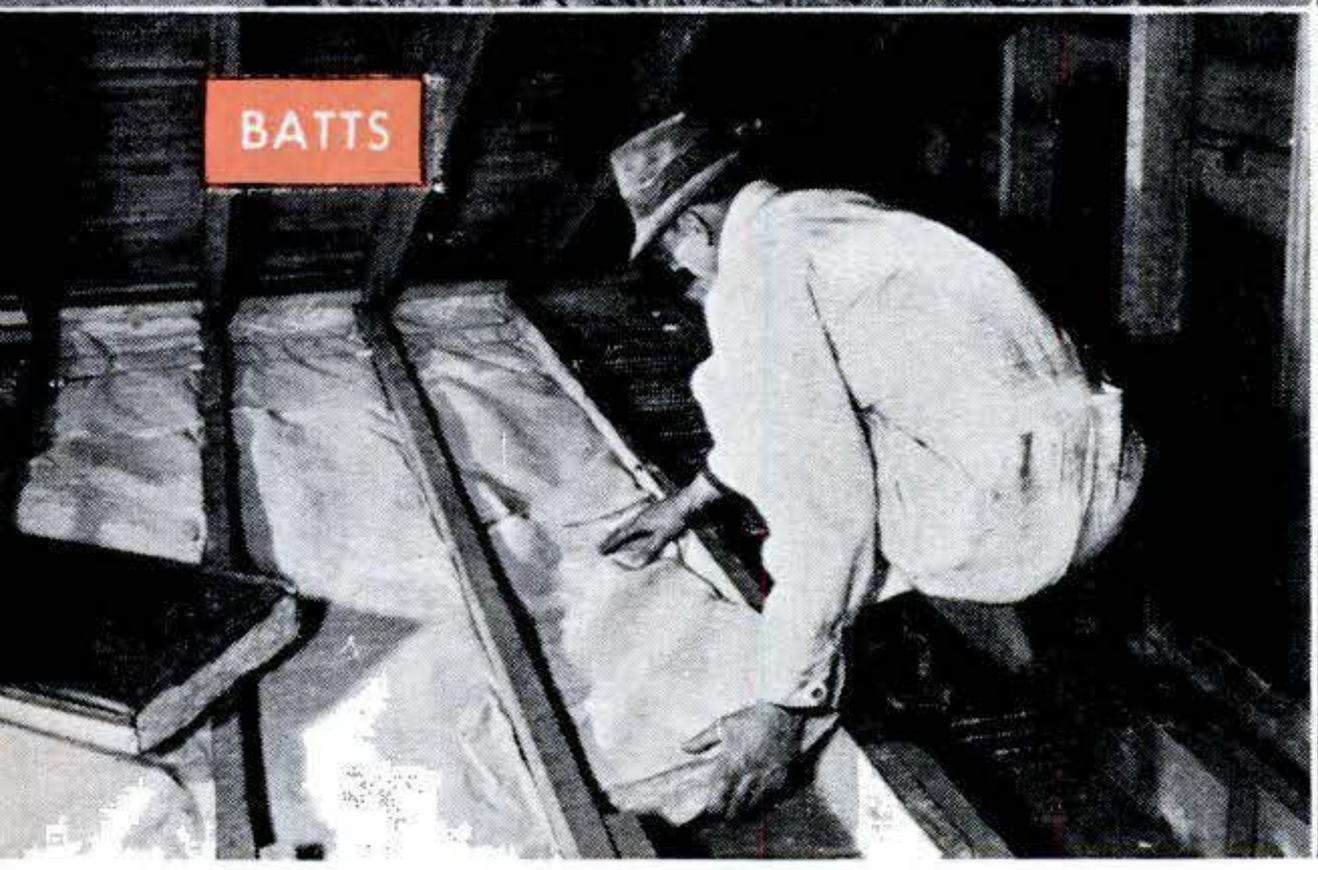
Where the attic is not floored but has just walkways on the joists, it's simply a matter of lugging the insulation upstairs and putting it between the joists. Bags of loose fill are bulky, and you may have some trouble getting them up narrow stairs or through a small hatchway. If there's a fair-sized attic window, it's often easier to rig up a pulley from the roof overhang and haul the stuff up.

A plastered ceiling between the joists must be treated gently, of course, since it won't take much of a load. It's a good plan to cleat together a platform of boards to stand on so that you can slide it along the joists as you work.

Work with an old hat on because it is often a dusty job and you are also apt to konk yourself on the rafters. And if you put in loose mineral wool, work with gloves—the material may irritate your hands.

If the attic flooring is nailed down, you aren't necessarily prevented from putting

Copyrighted material



insulation between the joists. Often the boards are really subflooring, put in carelessly and not thoroughly nailed to the joists. If that's the case, it isn't much of a job to pry up six or eight boards, put in the insulation, replace the boards, and move on.

Installing your insulation. If you use batts or blankets in your attic, lay them between joists and staple them between studs and rafters. Loose fill, of course, is poured.

Reflective insulation should always be installed with an air space—at least ¾″—on each side of it. As soon as reflective insulation is placed where its face touches another surface, it loses efficiency. The metal foil then conducts heat.

Foil insulation can be stapled on the edges of framing members, but it's better to staple it between them. Then if you later decide to finish your attic, you can nail up wallboard and the board won't touch the foil.

When installing any insulation, remember to follow the maker's directions closely. His insulation is made to be installed in certain ways. Follow his instructions and you'll get the best results from your work.

Ventilation. This is a must, especially for summer comfort. Keep the air moving out from under the roof as it heats up and the heat won't have a chance to transfer to the rooms below.

When you're insulating between the rafters, start at one side where the rafters meet the joists. Don't carry the insulation all the way to the roof peak. Run it across between the collar or tie beams and down the other side to the joists.

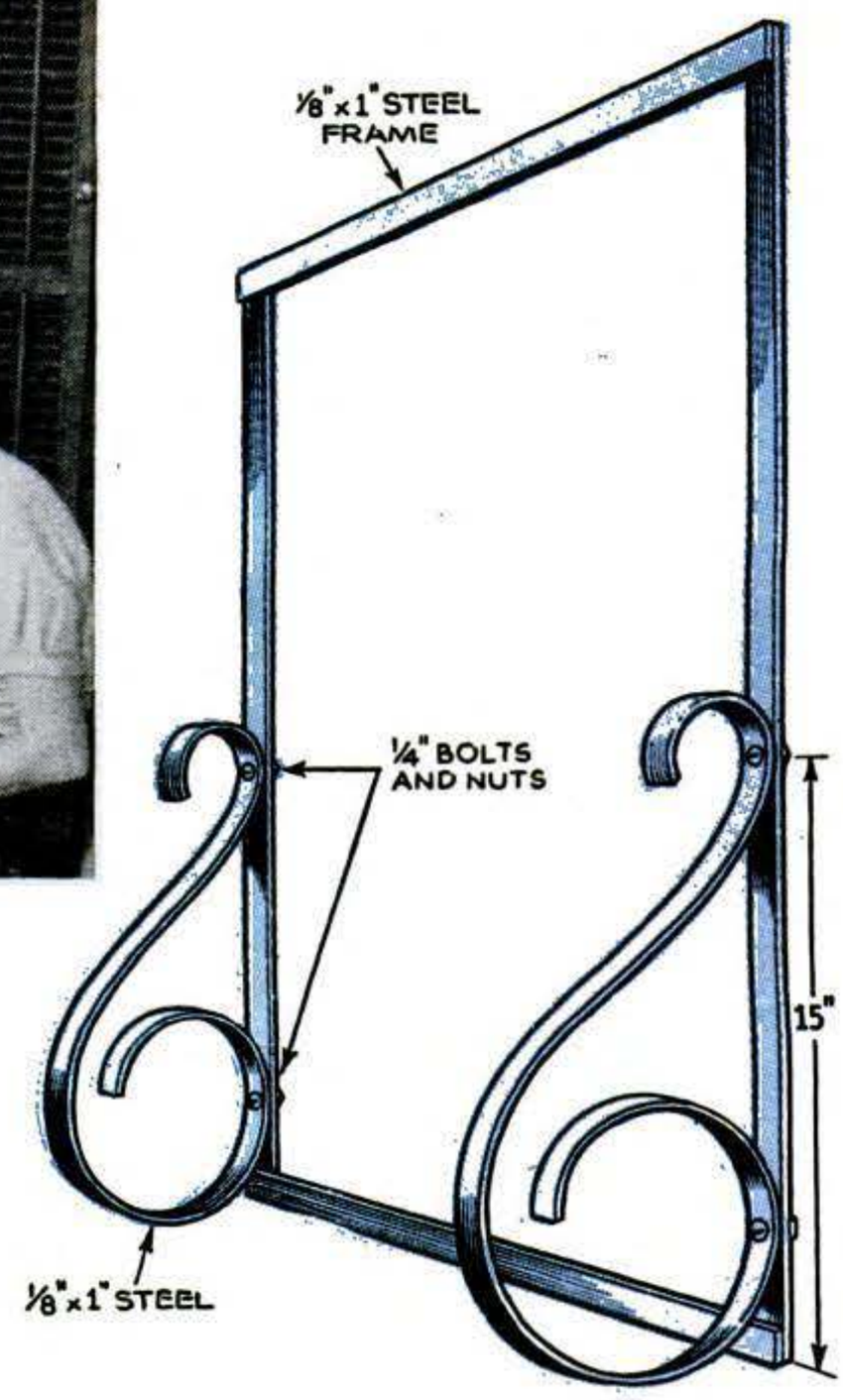
For ventilation, install louvers at each end of the attic. Place them as high up as you can get them. They must be above the collar beams and the insulation.

While you're about it, see to your storm sash and weather stripping. Neglecting these two safeguards is like locking the barn after the horse is gone. A lot of the heat saved by insulation and calking can be lost through loose-fitting windows and doors.

END

Bargains from house wreckers: You can save real dough on doors, windows, bath fixtures and many other things by buying them secondhand. See PS next month.

Copyrighted material



Iron Fire Screen Built in One Evening

You can turn out this practical fireplace accessory with just a handful of tools, even if you've never hammered a rivet.

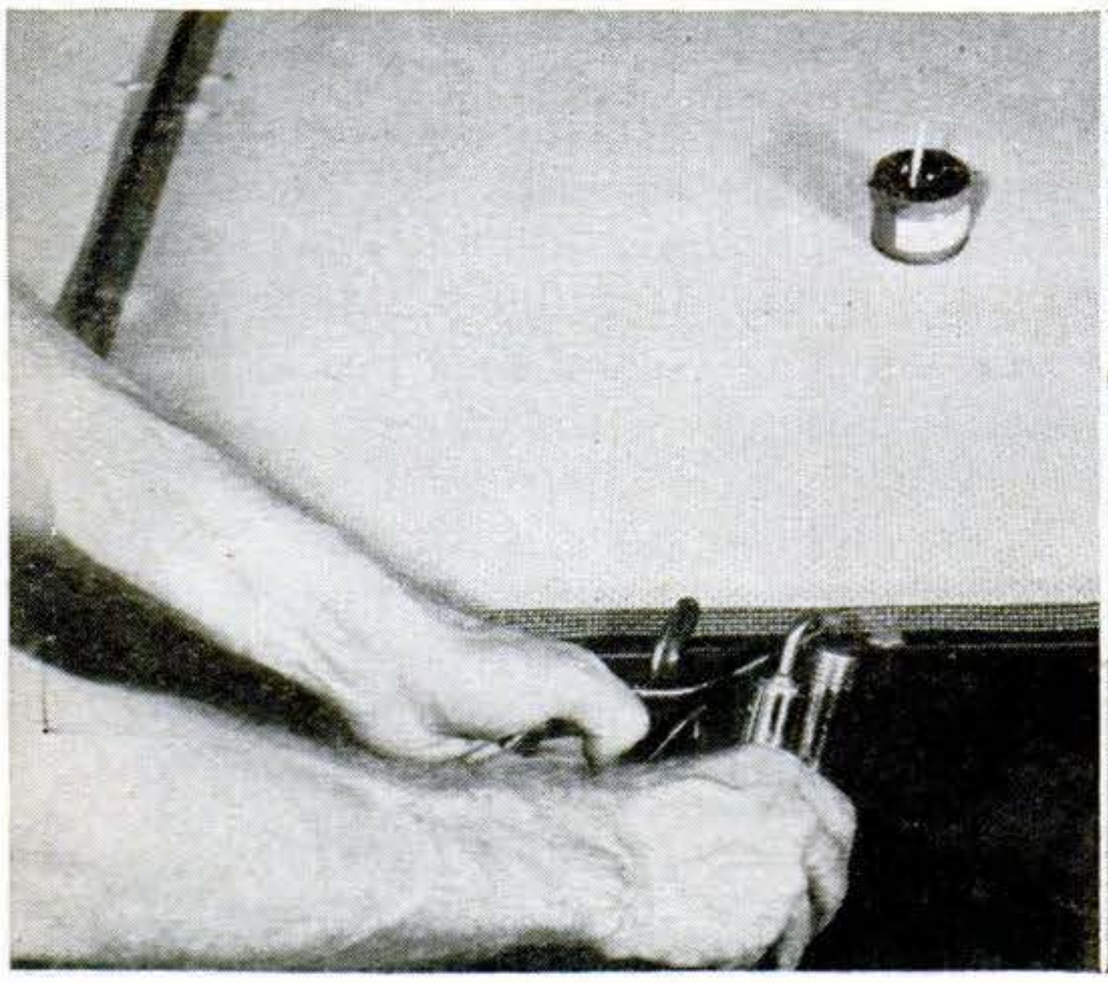
YOU don't have to be the village blacksmith, complete with anvil and forge, to build this metal fire screen. I did it with ordinary tools and less than $3 worth of material in about three hours.

After I hacksawed the four frame members to length to suit my fireplace, I squared them and clamped them together. Then I soft-soldered each corner. The ⅛"-mesh hardware cloth was stretched over the back of the frame and spot-soldered.

The use of soft solder on a fire screen may sound risky. But it has worked okay for me because the fireplace heat isn't intense enough to melt the solder and because the screen conducts the heat away fast.

However, if you prefer, you can use rivets to fasten the frame corners and hold the cloth to the screen.

To finish the screen, I painted it black and then antiqued it with gray-green glaze. *—John Rogers, Dallas.*

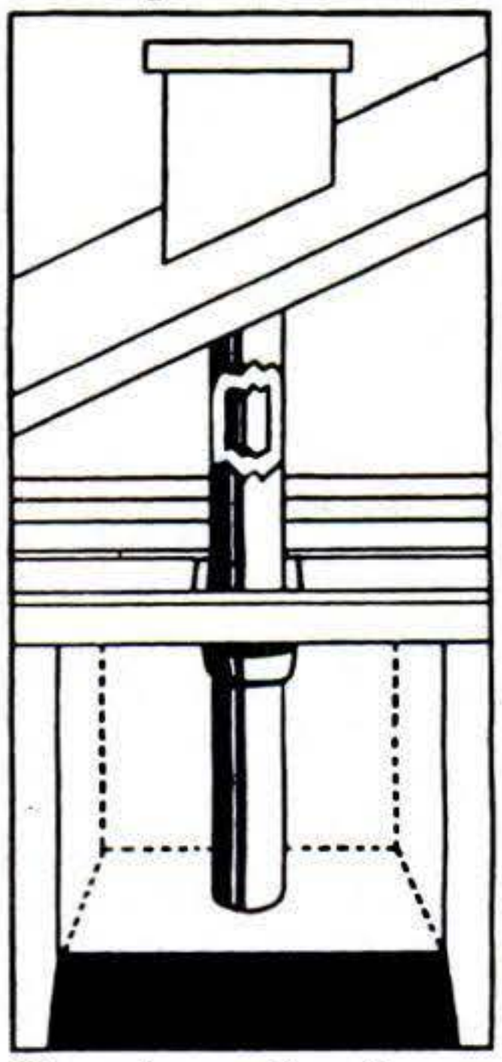


Screening was stretched evenly across the back of the frame, clamped and spot-soldered at intervals. An alcohol torch proved handy for this.

Feet were bent from ⅛" flat steel without heating. A vise and a claw hammer did this job. Feet should be riveted or bolted to the frame.

Copyrighted material

Fireplace Needs No Masonry

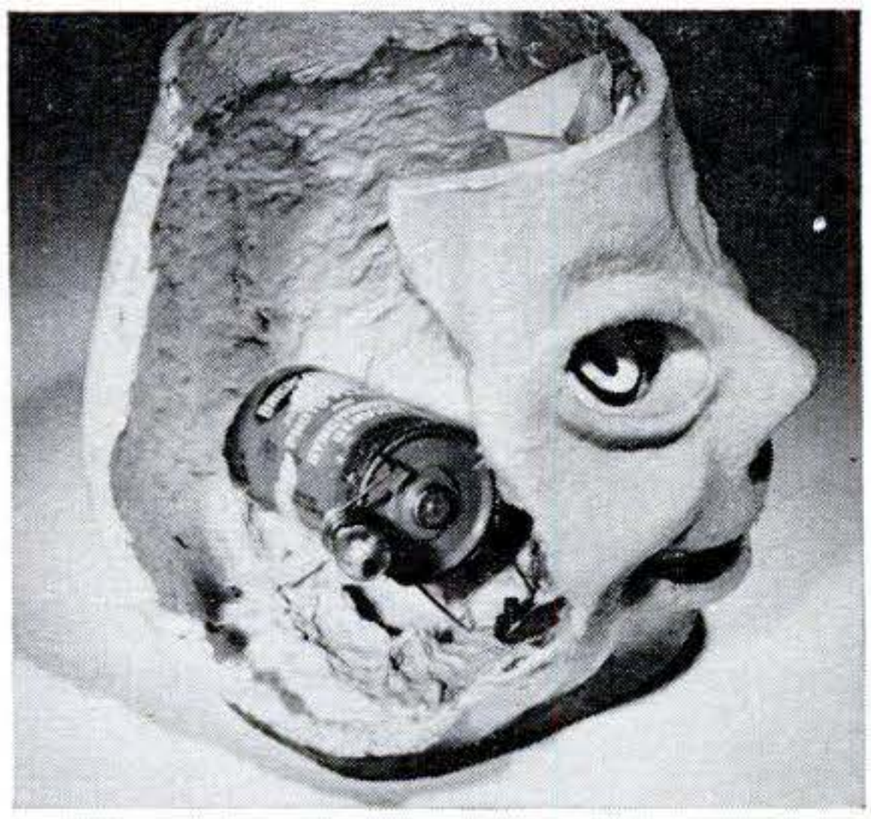


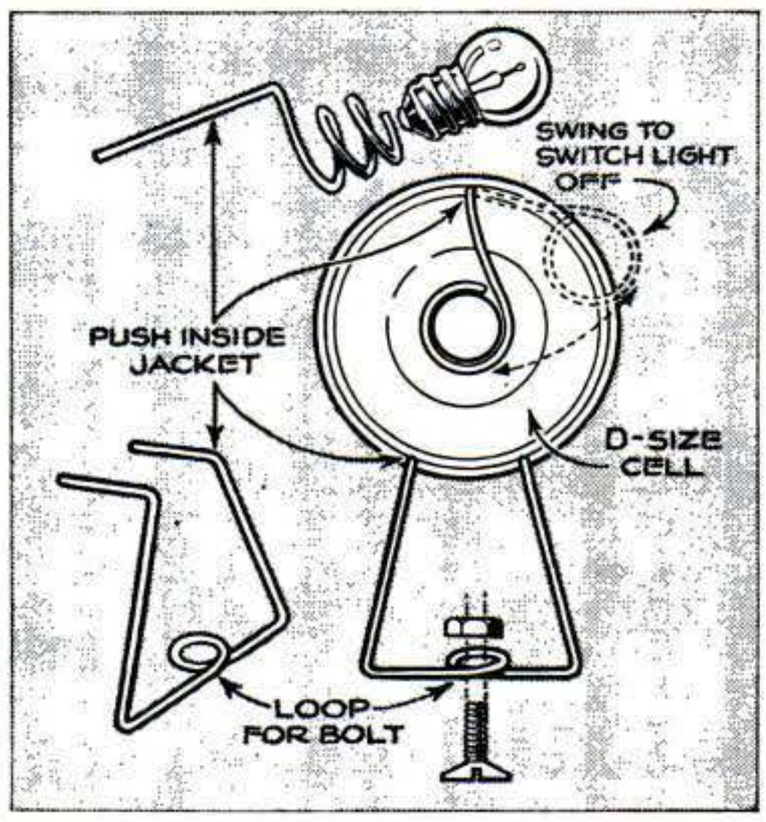
HERE'S a real wood-burning fireplace, complete with hearth and chimney, that can be bought "off the shelf," carried in and installed without tearing up the house for costly masonry work.

The Hearthplace and prefab chimney can be set up in a day's time, according to the maker, LaSalle Products Inc., Elkhart, Ind. The chimney housing on the roof is galvanized sheet steel. Fireplaces for flat-wall or corner use are obtainable in genuine mahogany, walnut, birch and knotty pine.

Lighted Jack-o-Lantern Is Safe

A LIGHTED pumpkin safe for the youngest kids can be made with a flashlight cell and bulb, two paper clips, a bolt and a nut. The dry cell will last for a whole evening of fun.

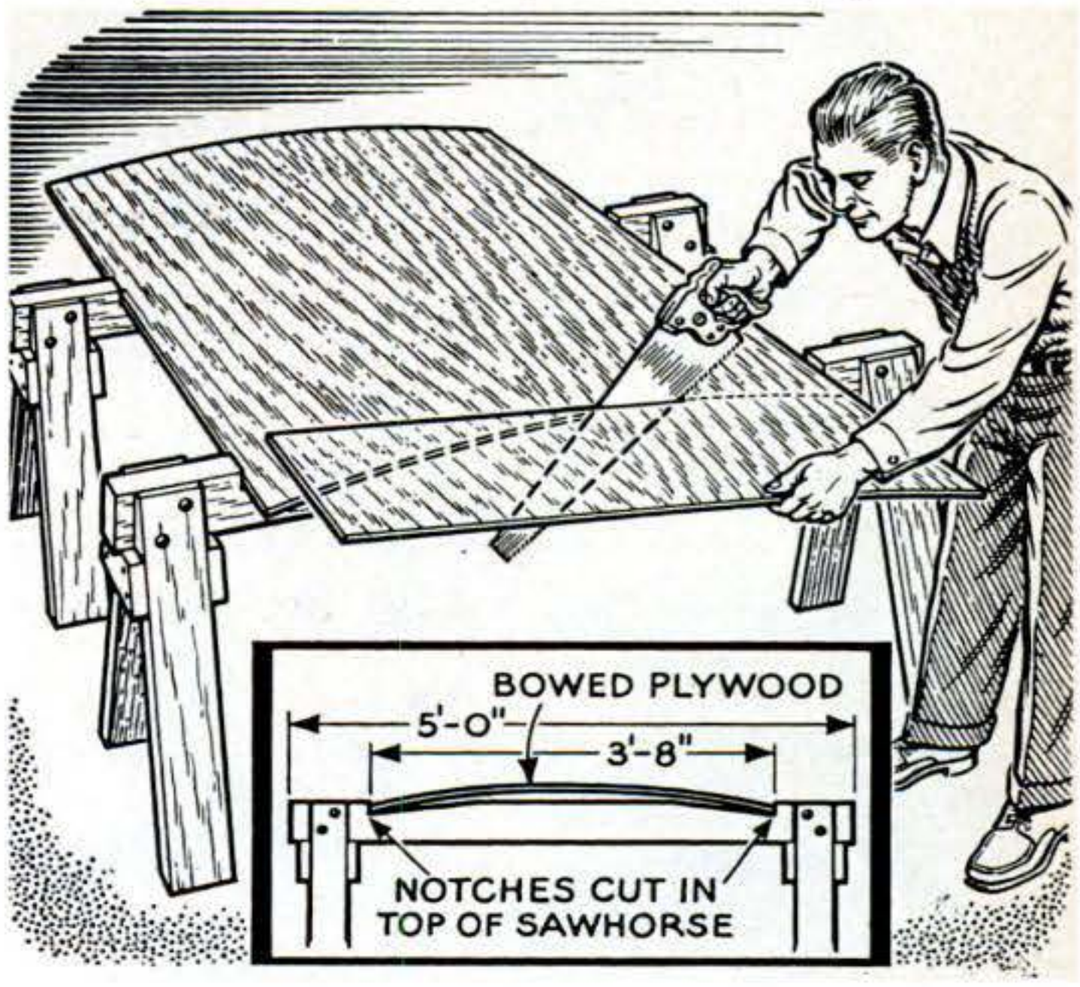




Straighten both clips. Bend one around the bulb base, leaving a straight leg that can be pushed into the cardboard jacket of the cell, with the bulb on the center contact. Swing it aside to turn the light off, as shown by the dotted lines.

Shape the other clip into a foot. Push both ends into the cell jacket. Punch a hole in the bottom of the jack-o-lantern and bolt the foot down through the bent loop at the bottom.—*H. Walton.*

Saw Horse Helps Cut Plywood

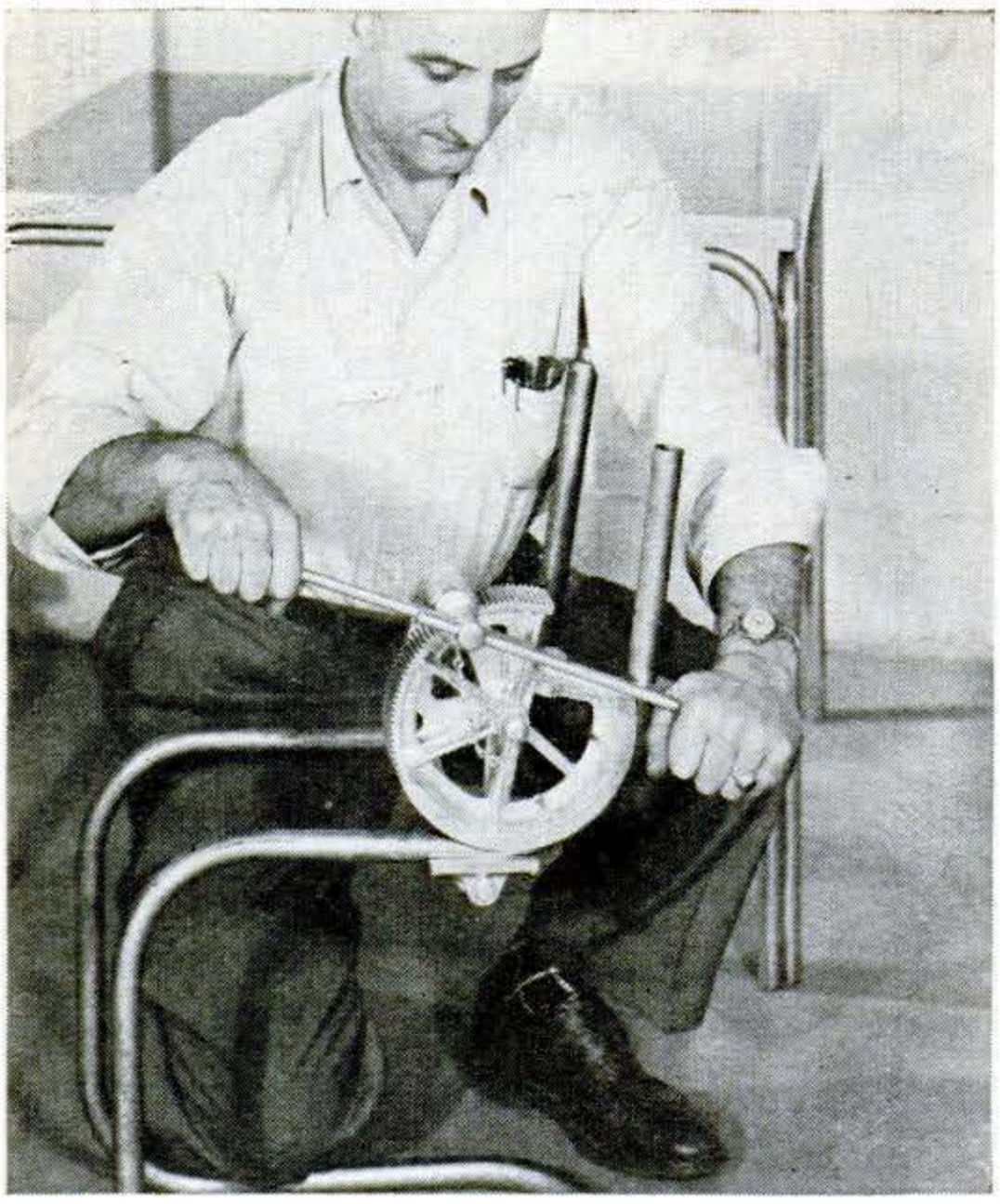


BECAUSE craftsmen often buy plywood in less than full-sheet sizes, one lumberyard uses special saw horses to hold the sheets for cutting. Each horse is about 5′ long, with a notch cut in the top about 3′8″ long. The plywood is bowed to fit into the notched section, which holds it tightly, cutting down vibration. The sawing can then be done without difficulty.—*G. E. Hendrickson, Argyle, Wis.*

Enamel Covers Dark Finish

WITH a new enamel trio you can apply a blonde or limed-oak finish right over a dark-wood finish without even sanding. It's good on natural woods, too, where the grain is unattractive. A ground color is applied first, followed by a graining liquid and a clear finish. N-B Enamel Paint Co., Union City, N. J., makes it.

Copyrighted material



Pipe Bender Shapes Furniture

MODERN kitchen, porch and lawn furniture can be made by the home craftsman with the aid of the tube bender pictured above.

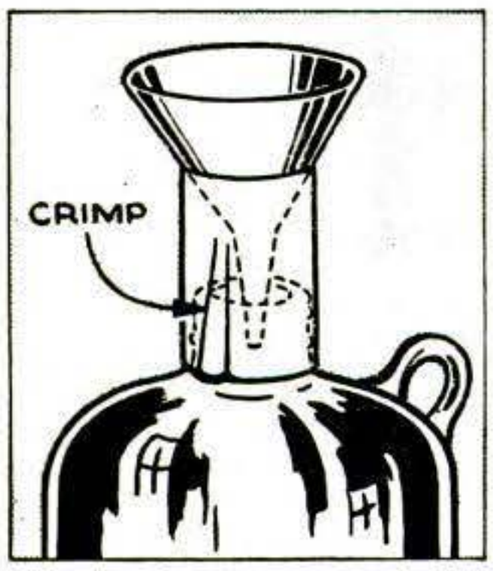
The tool, originally designed for plumbing and electrical work, makes smooth bends in 1″ steel, iron, brass or aluminum tubing. It is made by Holsclaw Bros., Evansville, Ind.

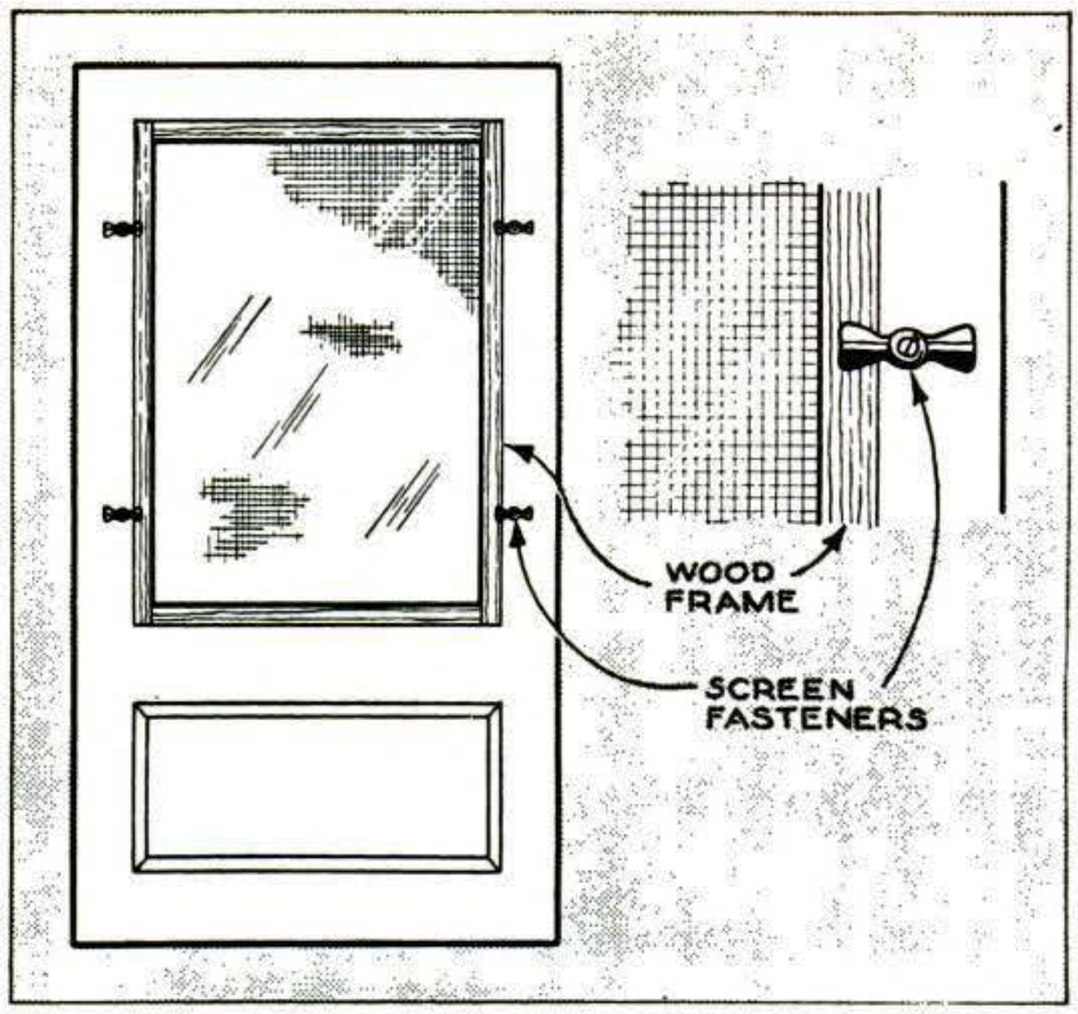
Nail Set Removes Wallboard

IT'S sometimes necessary to remove a section of wallboard when remodeling or repairing. Prying it loose may damage it. A better method is to drive the fastening nails all the way through the board with a nail set. When replacing the board, fill the holes with plaster.—*A. Yaw, Seeley, Calif.*

Tin Can Helps Fill Jugs

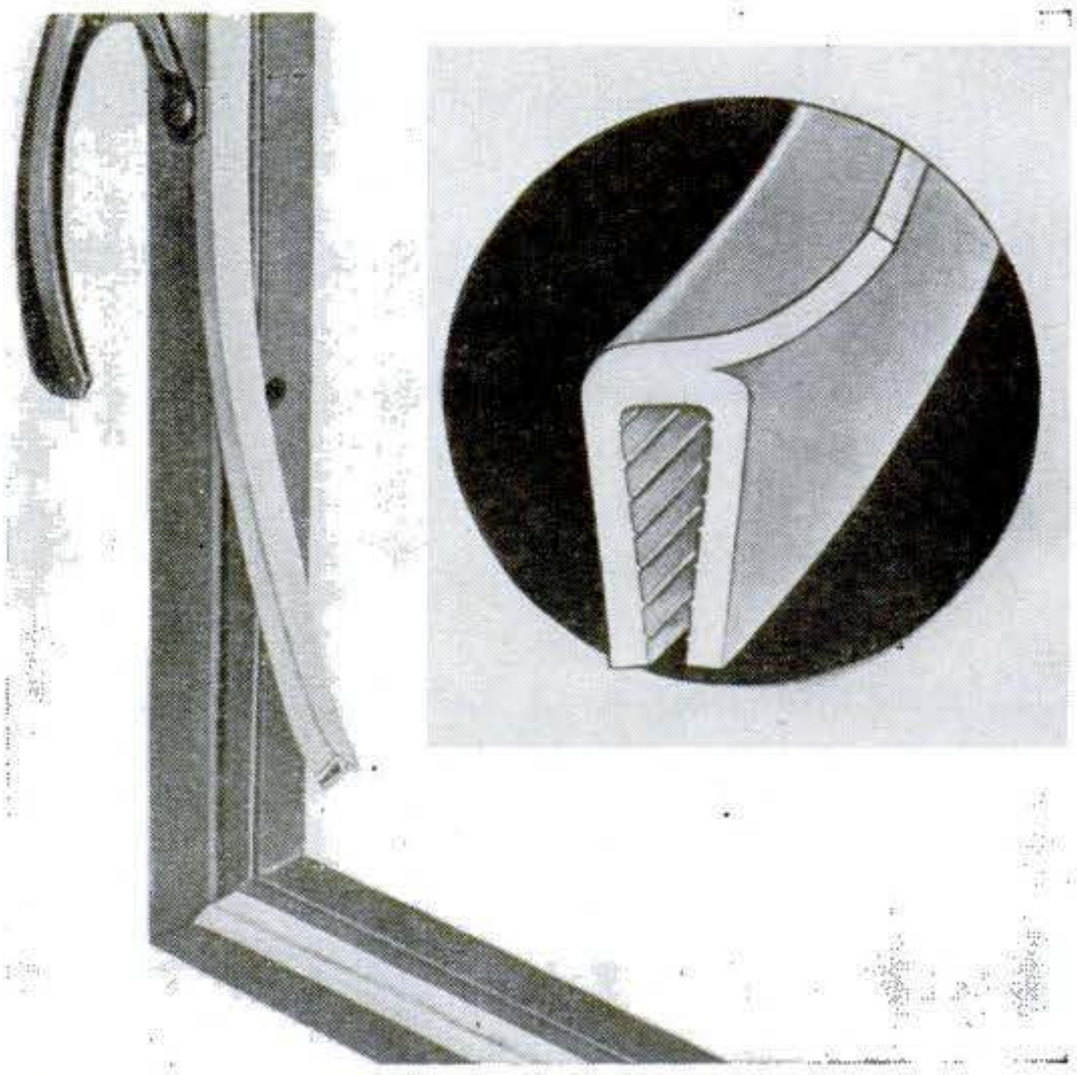
IF YOU have to fill a number of jugs, you can save time with this setup. Cut the bottom from a tin can and set it over the jug opening to receive the funnel. It will raise the funnel, allowing air to escape as the liquid is poured and insuring a rapid, even flow. If the can rests too snugly on the jug, put a crimp in the edge with pliers to allow the air to escape more quickly.—*G. E. Hendrickson, Argyle, Wis.*





Plastic Glazes Storm Doors

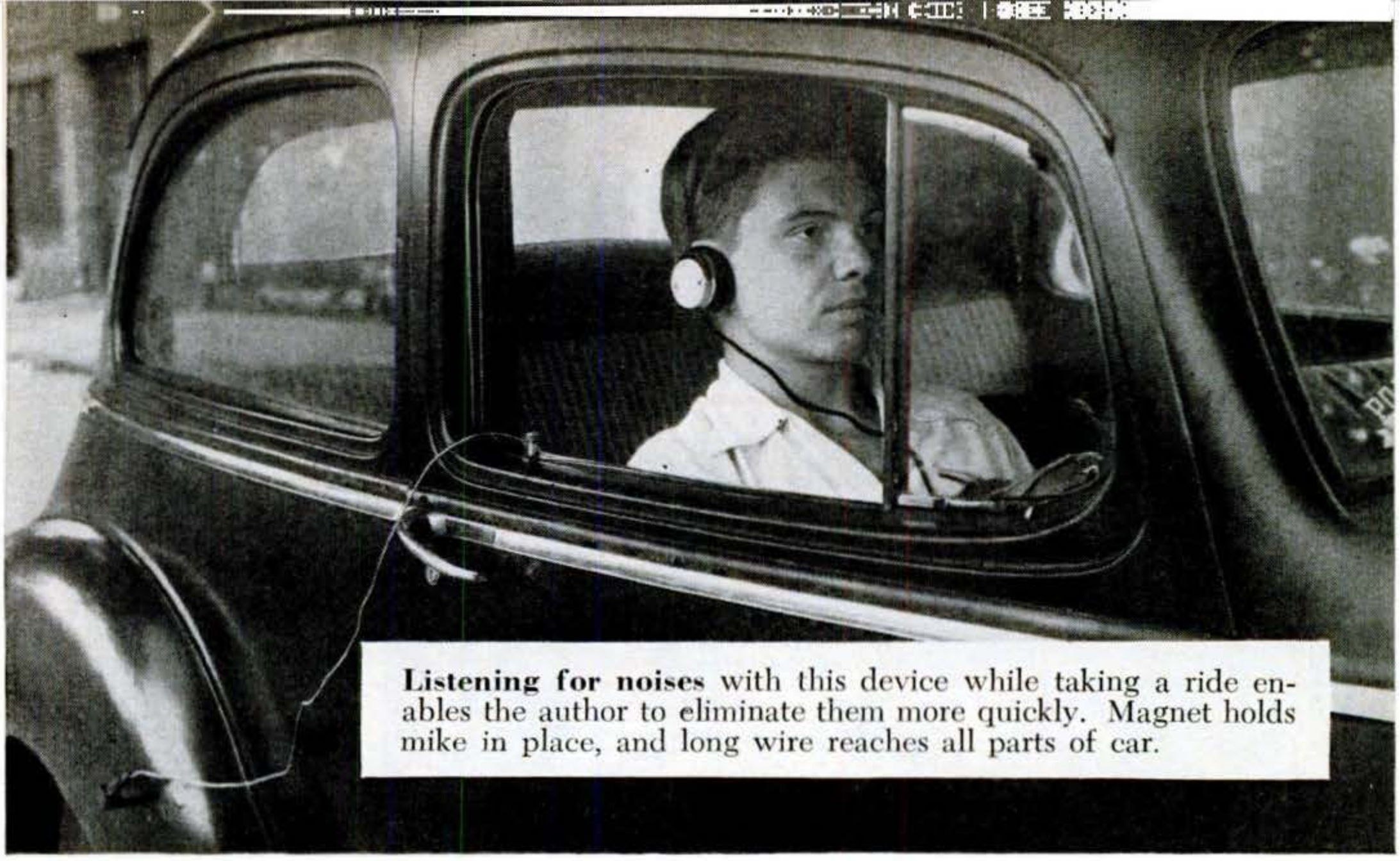
THE wire- or cord-reinforced plastic sheeting used in place of glass on poultry-house windows can help to make your house airtight this winter. A framed panel of the material, attached to a screen door as shown, will convert it to a storm door. Drafts that leak in around cellar windows can be blocked out by tacking the sheeting to the inside of each window.



Plastic Strip Seals Casement

FLEXIBLE vinyl channeling for sealing a metal casement window against drafts, water and dust is sold in 38″ lengths and can be cut to fit with ordinary scissors. Tiny ridges molded inside the strip grip the metal casing. The added lip at the top (shown in inset) presses firmly against the window frame to make a tight seal. Draftite Products Co., Dayton, Ohio, makes it.

Copyrighted material



Listening for noises with this device while taking a ride enables the author to eliminate them more quickly. Magnet holds mike in place, and long wire reaches all parts of car.

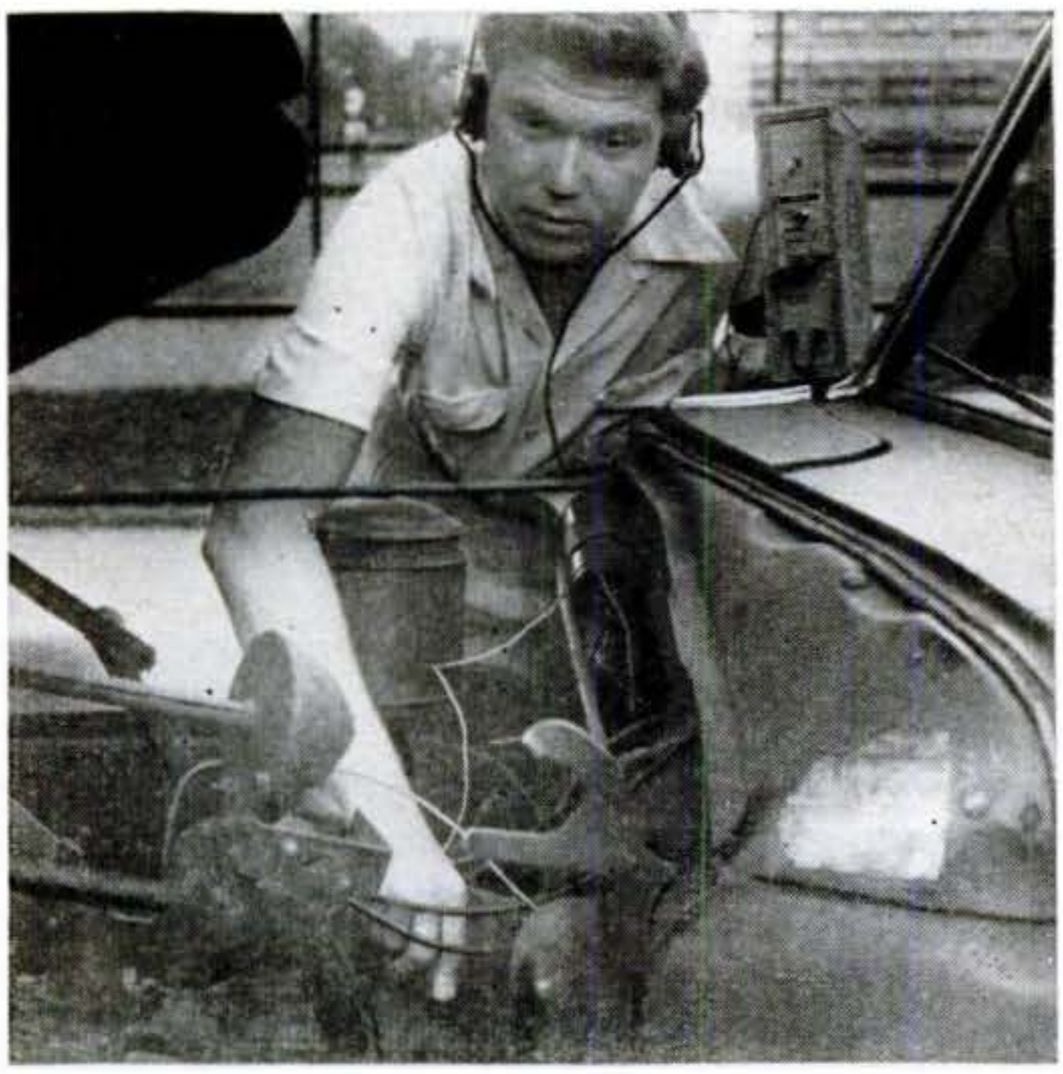
I Locate Rattles with a Stethoscope

My cigar-box outfit is better than a doctor's for the job. A mike picks up sound, transformer makes it louder.

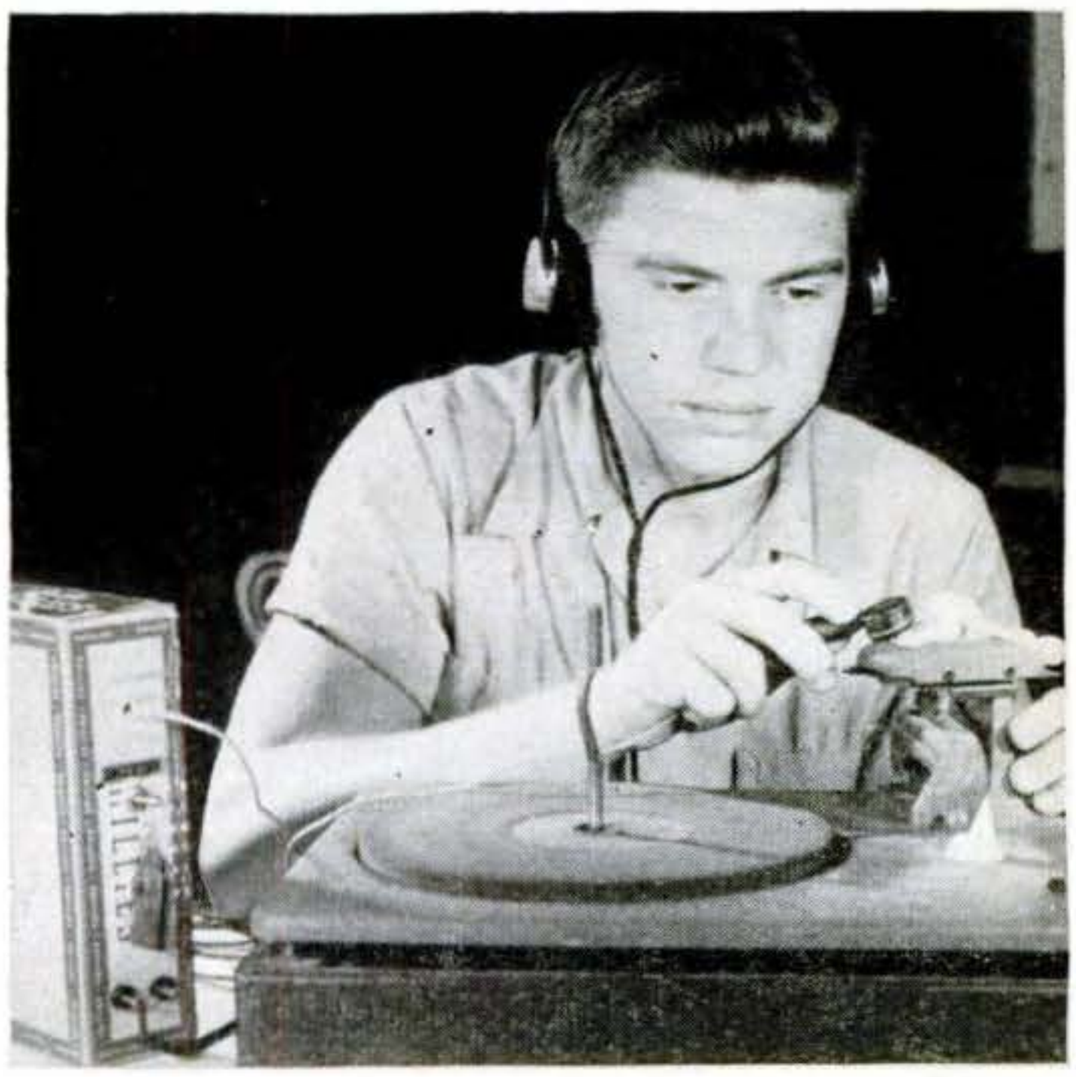
By David Findlay

EVERYBODY loves a quiet car. But any mechanic will tell you squeaks and rattles are harder to find than a mosquito in your bedroom.

My homemade electric stethoscope makes

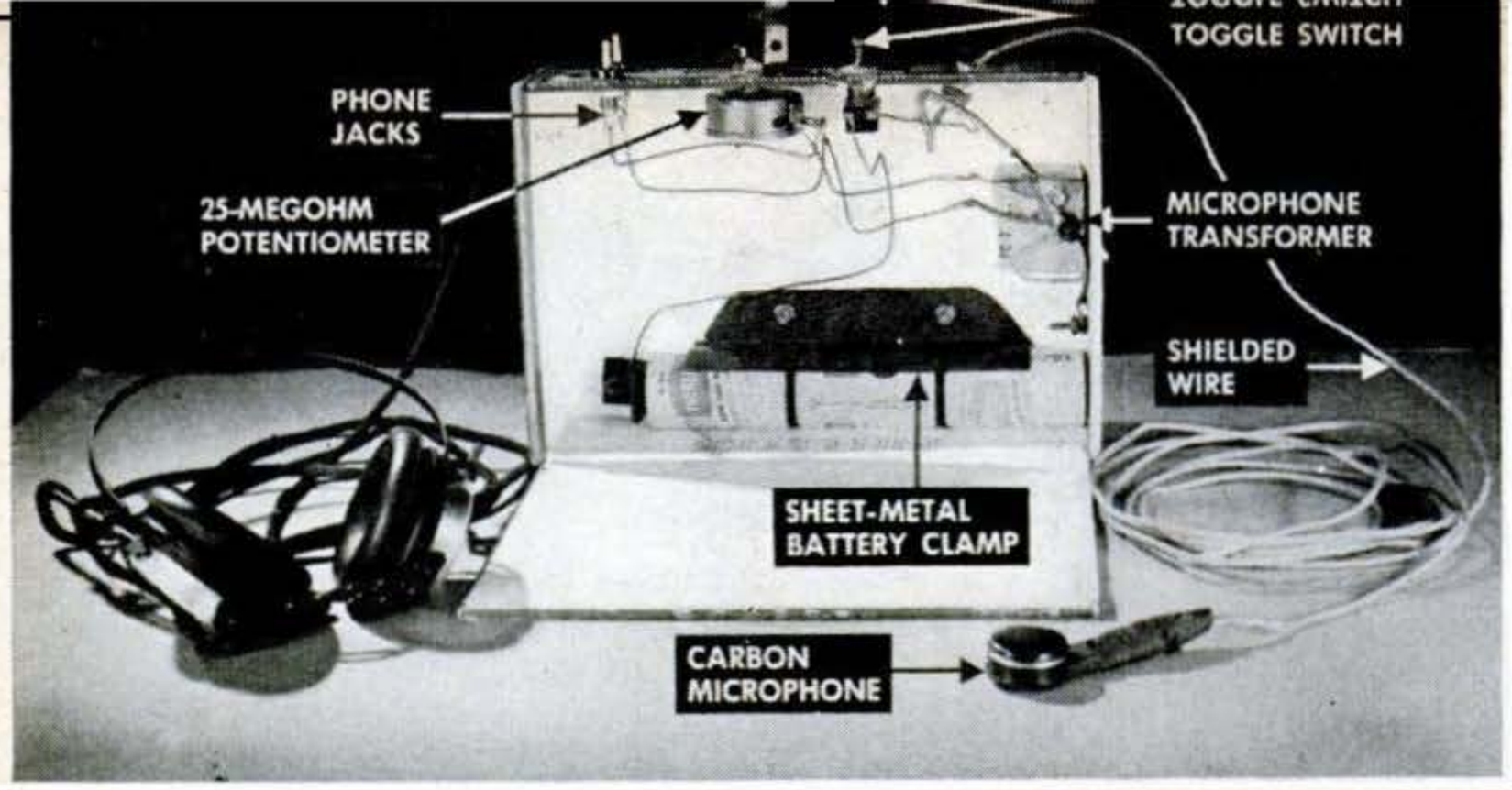


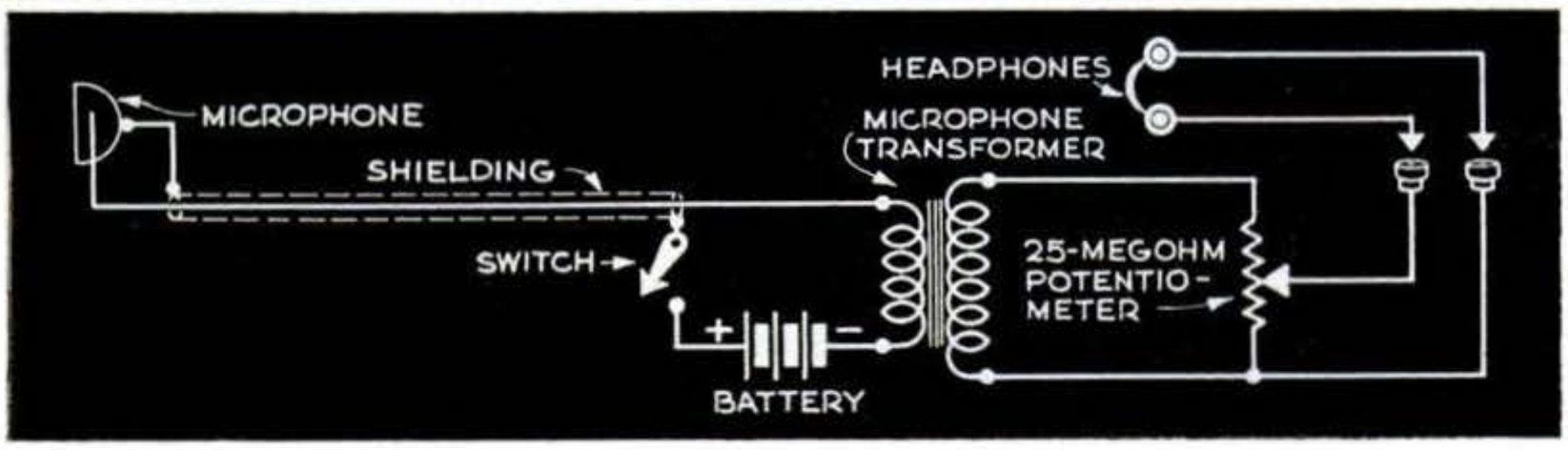
Engine knocks can be found too. Moving mike around on cylinder head picks out a slapping piston. Connecting rod knocks are loudest if mike is shifted to bottom of motor block.



Other uses. The 'scope will spot trouble in such household items as record changers, fans, vacuum cleaners. Hidden water pipes can be traced by turning on water, following sound.

Copyrighted material





Stethoscope parts are housed in a cigar box. Power comes from three 1½-volt flashlight cells clamped between two sheet-brass contacts. As in a radio, the potentiometer provides volume control, a help in such spots as a worn transmission where sound level is high. A "pot" of the value shown was found to give best results. Stethoscope will work well, however, without a volume control. Connect transformer output wires directly to phone jacks.

finding the cause of noises a lot easier. It can be assembled for peanuts from a few parts available in radio or electrical stores. A surplus throat microphone, bought for less than 50 cents, picks up the noise, but any carbon mike could be used. A doorbell transformer works well if you can't get a mike transformer like the one I used.

The assembled unit works like a doctor's stethoscope, but a 15′ wire enables you to listen from any seat in the car, a big help when you're tracking down a rattle or squeak that appears only when the car is in motion.

Front-end, steering and spring noises can be found by driving the car over a bumpy road with the microphone attached

Here are tips to help you silence car noises after you've found them.

Why Drive a Rattletrap?

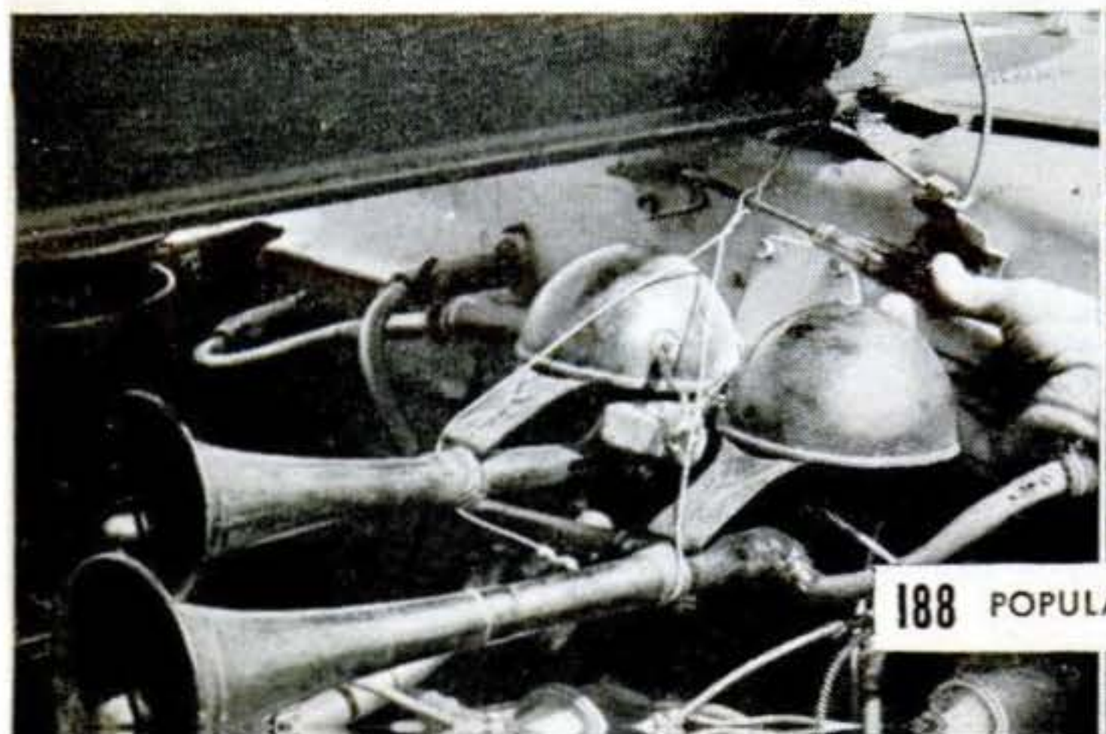
By Clinton R. Hull

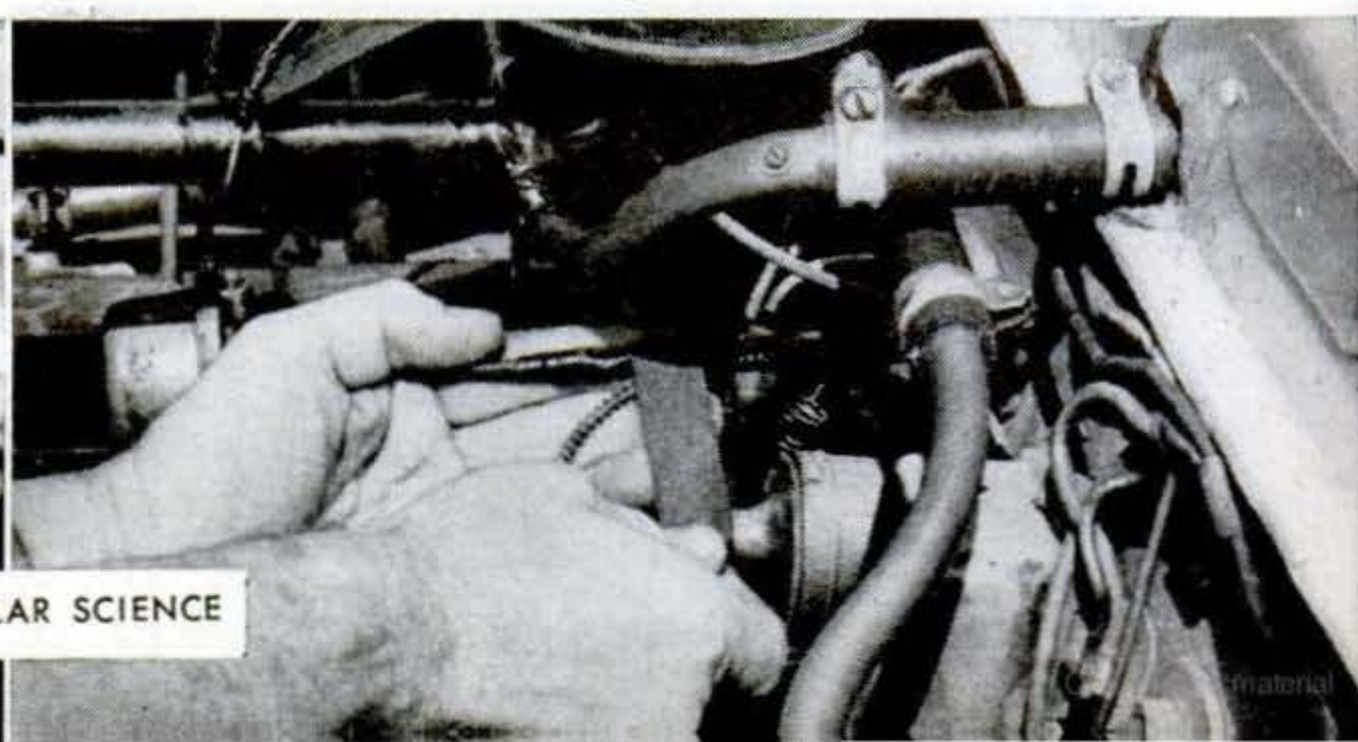
MOST squeaks and rattles in your car are easy to get rid of—once you've located them. Put a screwdriver in one pocket, a roll of tape in another, grab a grease stick in one hand and an oilcan in another—and you're ready for the villains.

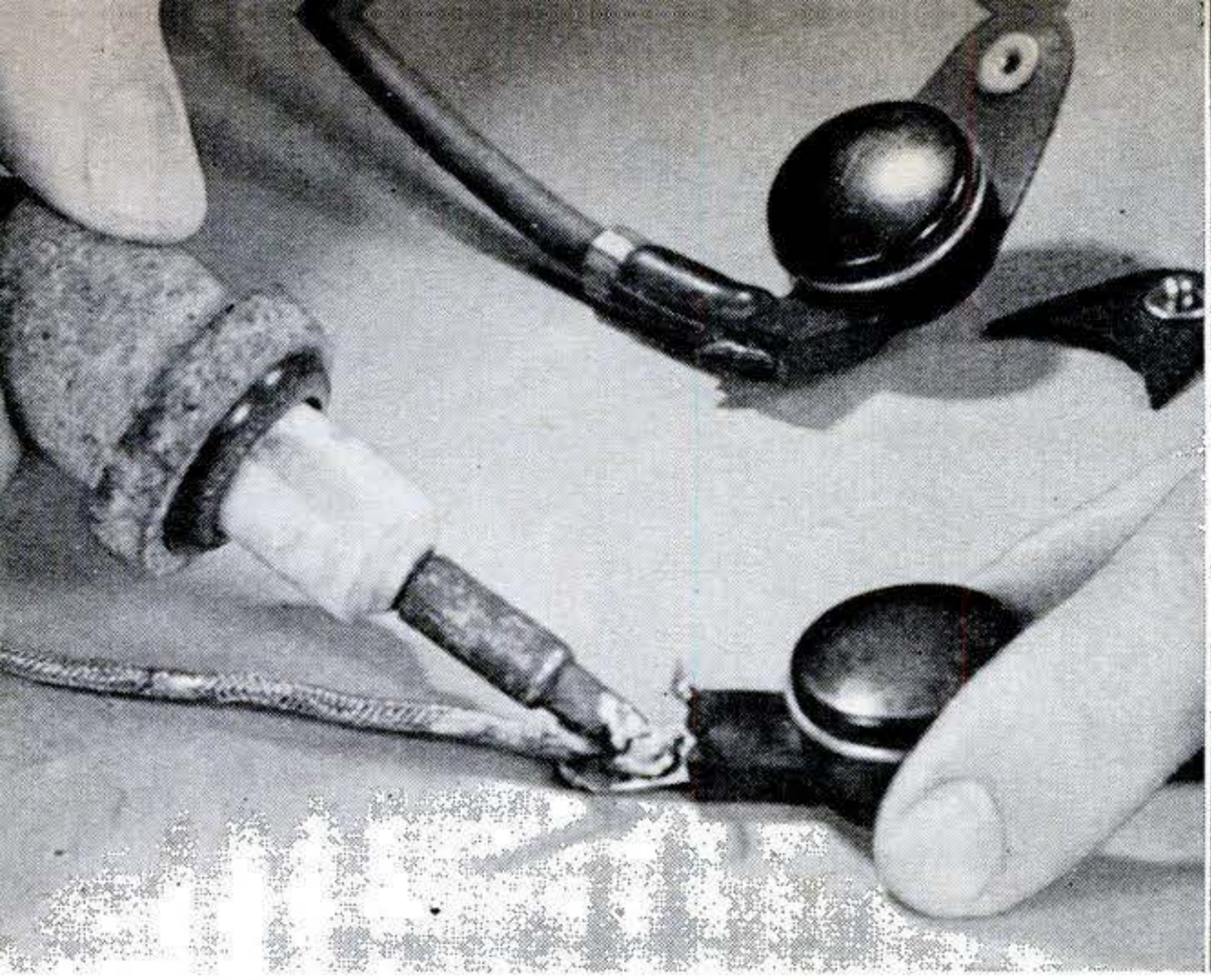
You can lick nine out of 10 noises with just this simple equipment. The photos and drawings on this and the next two pages give some suggestions on how to proceed—but remember that your own ingenuity counts too.

Twist-tension a wire bridle to stop rattle of horns mounted on firewall. Tape and lacquer bridle to improve appearance. Bridle can also be used to support muffler or tailpipe.

Tape cables and wires together in sets of two or more under hood and behind instrument panel to cut down cricket-like chirps. Tape, grease or wax at friction points also helps.





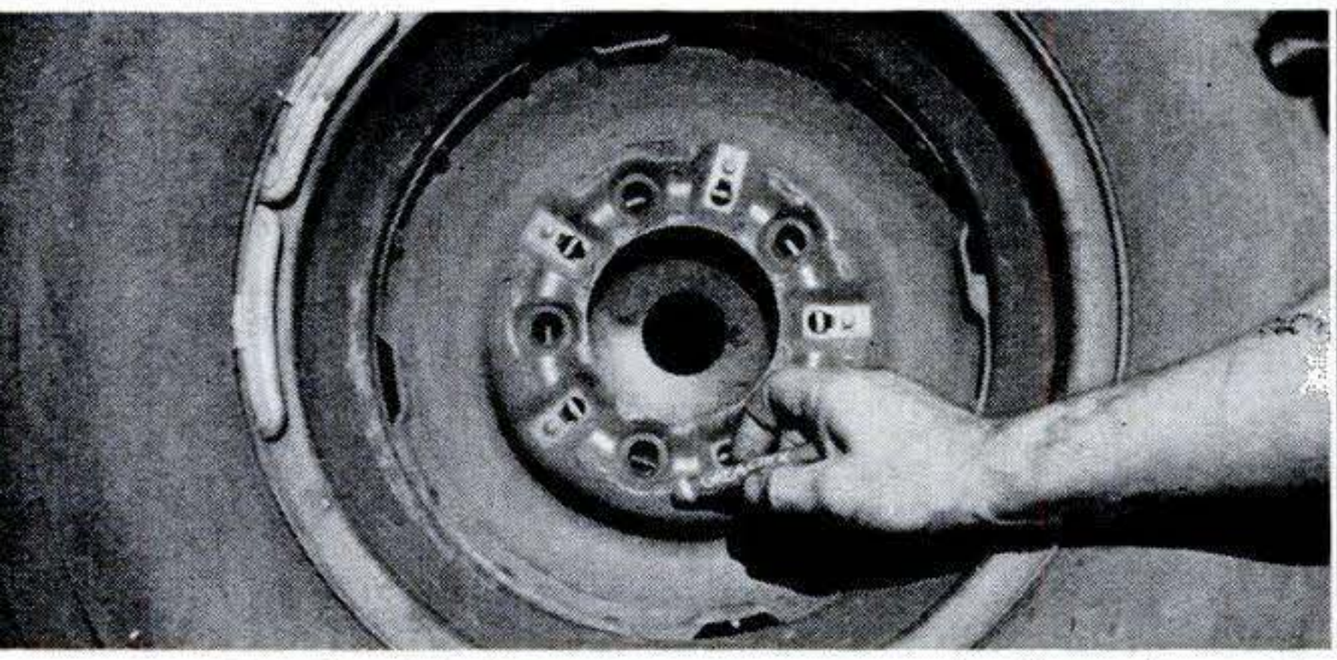


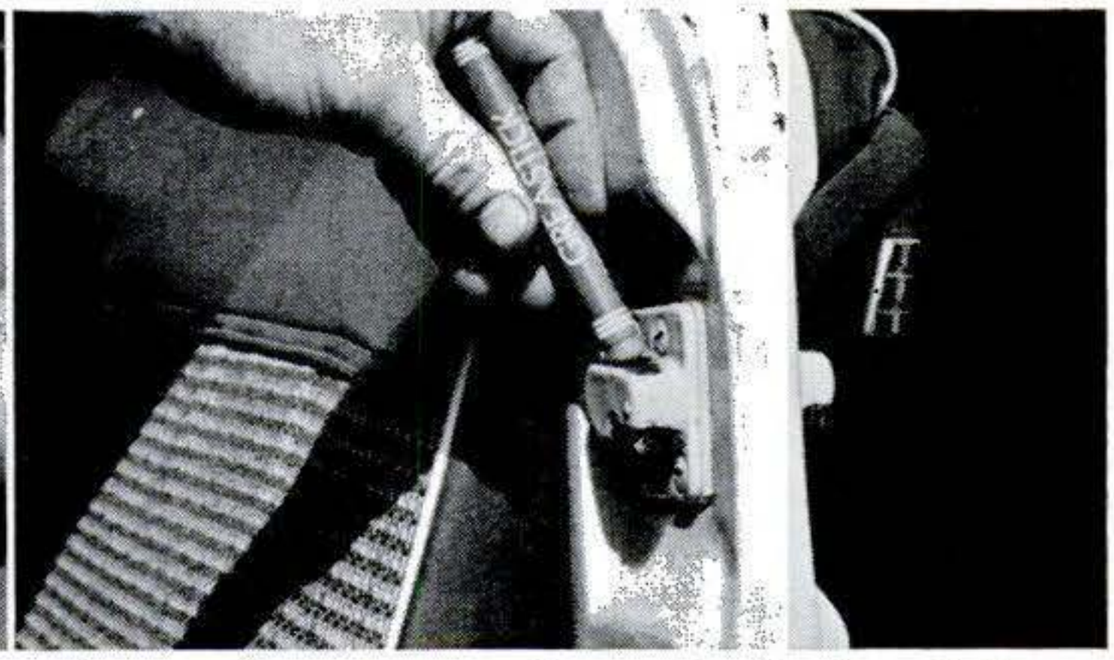
Microphone originally had two pickup heads. Since only one is needed, they were separated by cutting through rubber connecting strip. In center of this you'll find a wire and a steel strip. The shield of the transformer lead was soldered to the strip, the wire to wire (above, left). Alnico magnet is taped to mike head (above, right) for remote listening while car is in motion. Sounds are transmitted through magnet to the mike. Magnet isn't needed in close-up work.

to different parts of these assemblies. A loose bumper part will be almost inaudible when the microphone is attached to the hood or fender, but will sound off clearly when attached to the bumper.

When the microphone is placed on the side of a transmission or rear end, broken or chipped gear teeth will show up. The rattling sound that indicates worn bearings can be heard—you can even tell which bearing is at fault by placing the microphone over the position of each.

Moving the microphone over the motor will show the position of a knock, and the condition of the water pump, generator or distributor can also be determined.

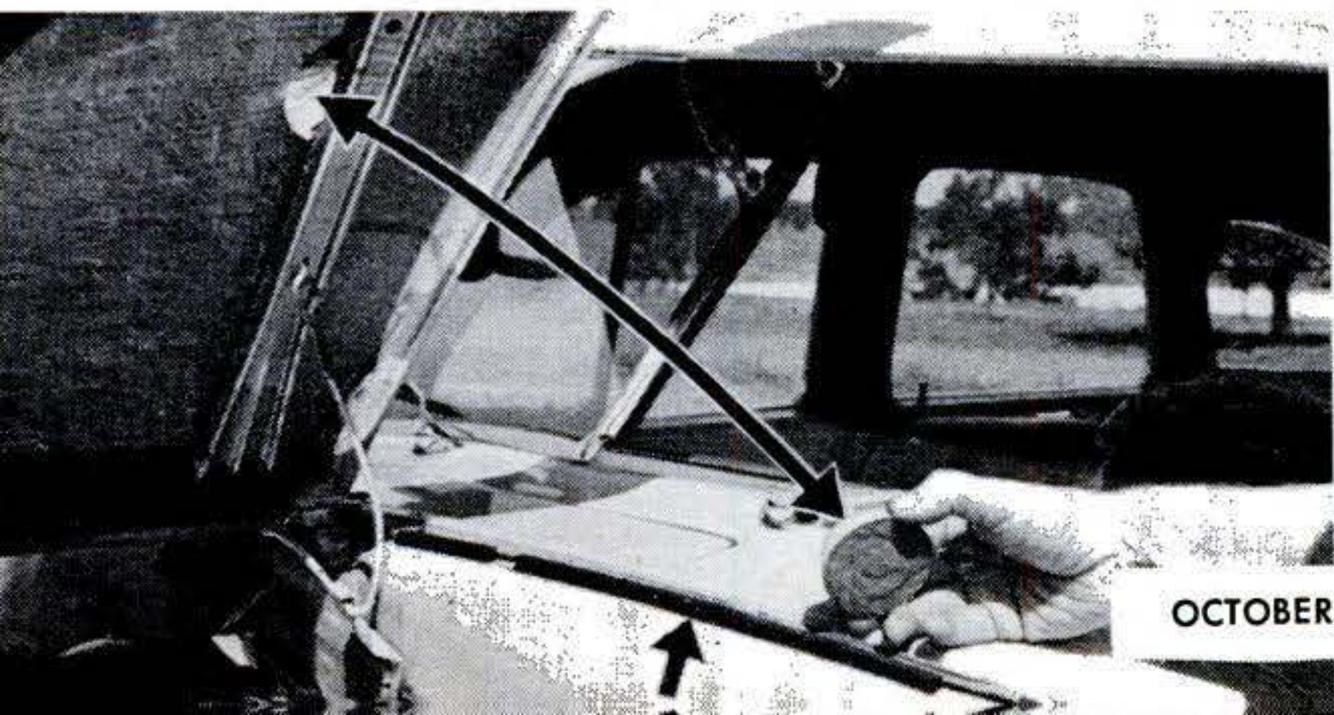


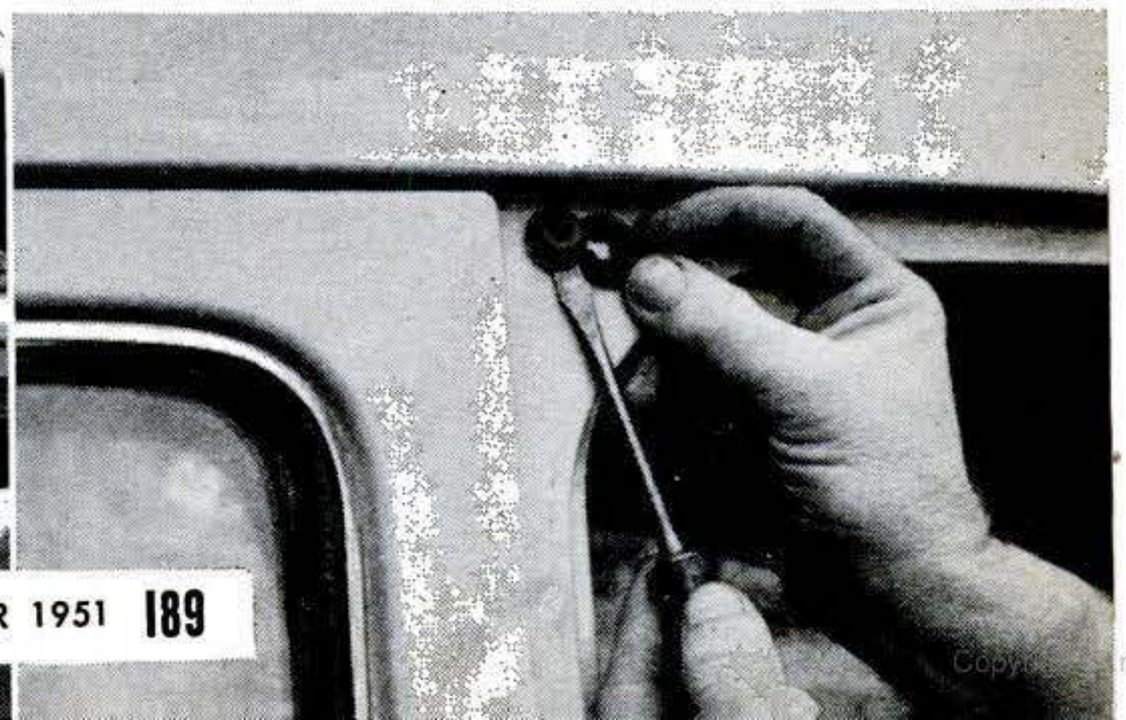


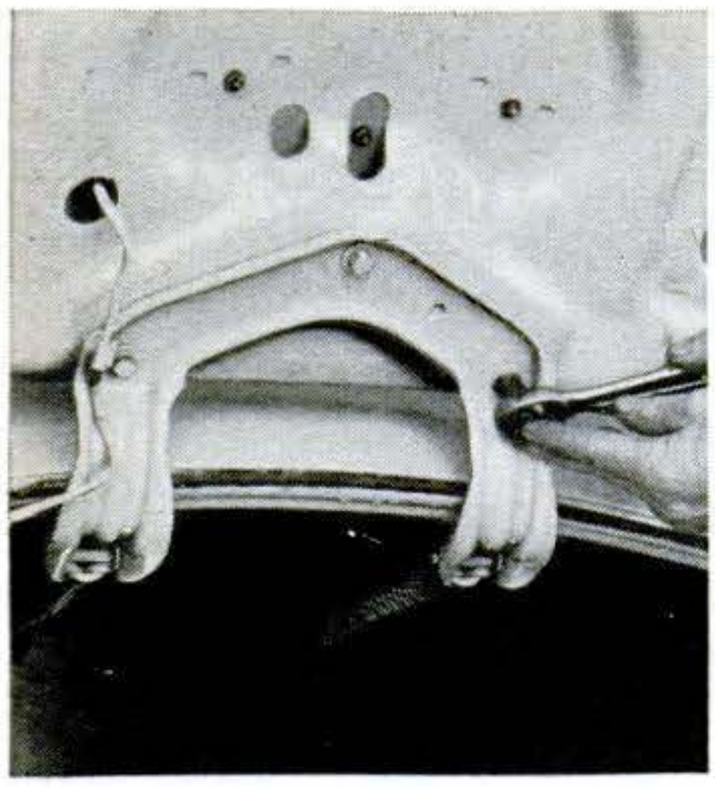
Lack of lubricant may cause wheel creaks and door noises. Apply stick wax to door striker plate and contact surfaces of wheel and drum. Use light oil on door hinges, latch mechanisms.

Sponge-rubber ball cut in half and inserted as shown will help deaden hood vibration. Rubber weather strip (arrow) can be applied where hood hits cowl if new hood lacing is needed.

Rubber striker buttons, shimmed up or replaced, may help eliminate door noises. To compensate for latch wear, loosen striker-plate screws and reset plate. [*Continued on next page.*]

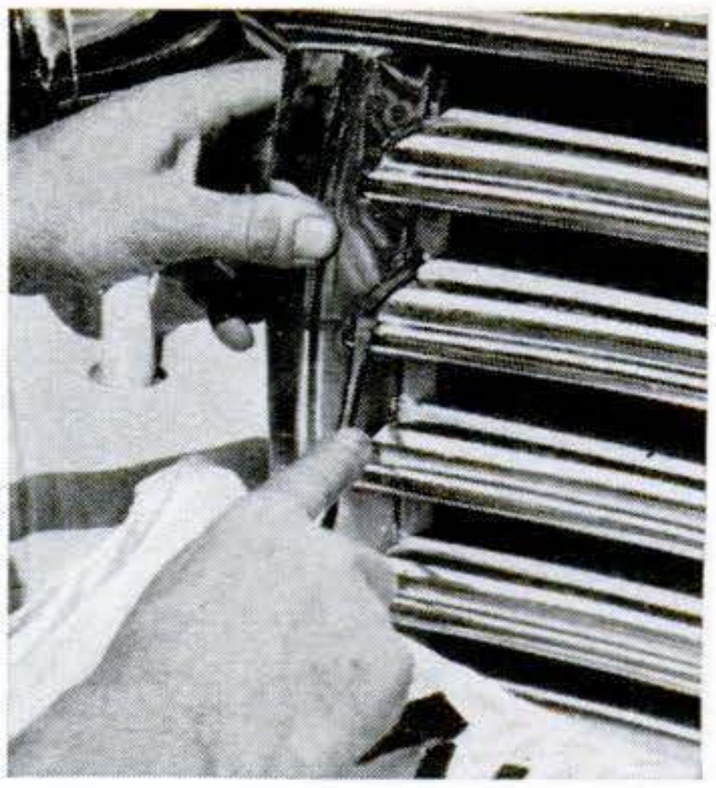


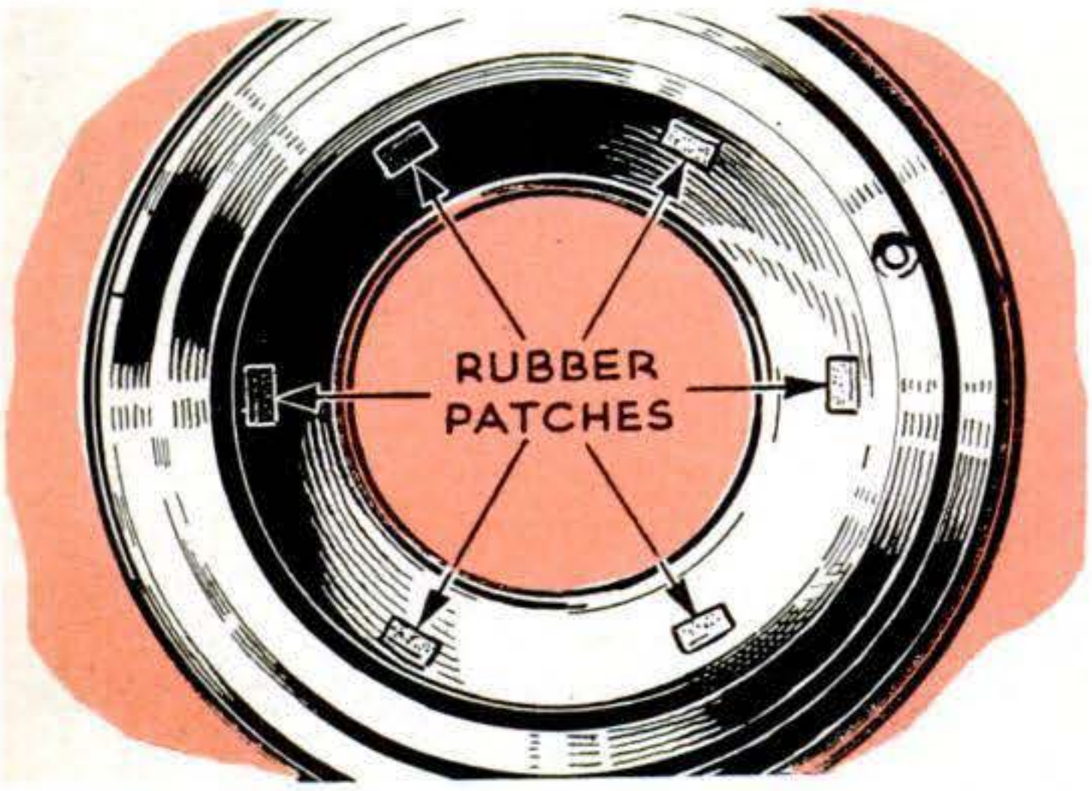




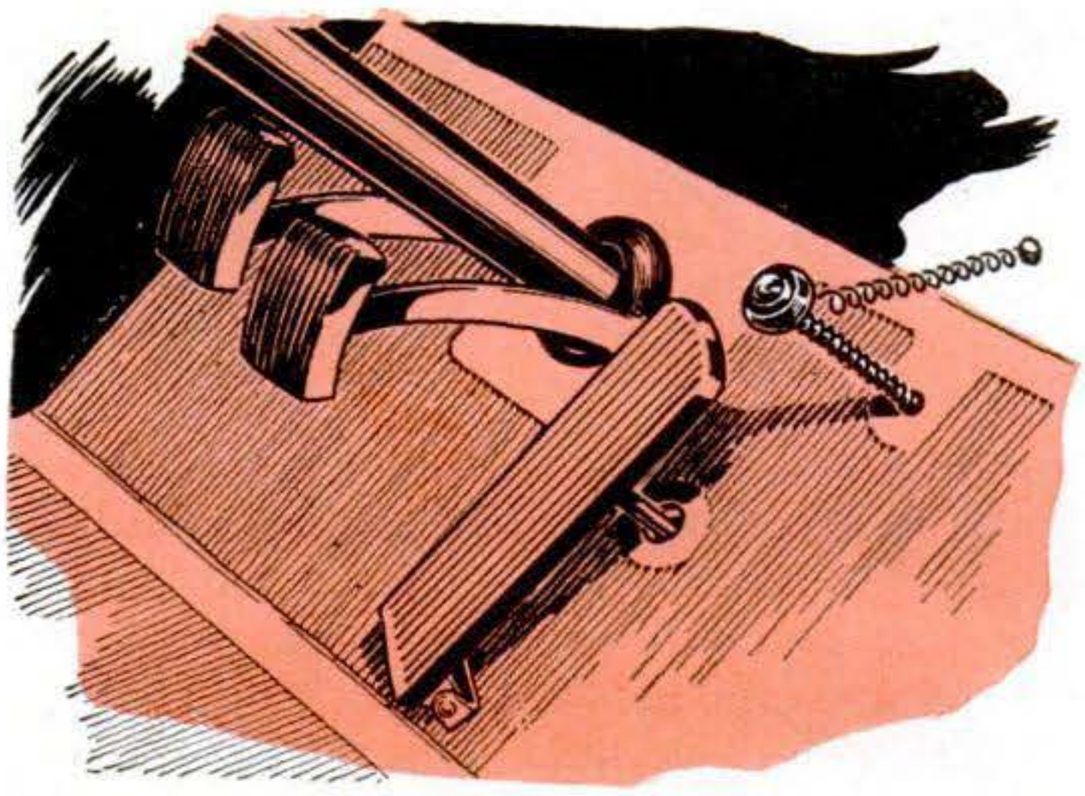
Trunk-lid mechanism is guilty of many squeaks and rattles. Oil, grease or wax stops squeaks in counterbalanced springs, spring rods, folding deck supports or latch. Tightening bolts or hinge rivets and increasing spring-clip tension on lid arms checks most rattles. If gasket has shrunk, loosen hinge bolts (left) and adjust lid to seat properly.

Bits of rubber or tape jammed into cracks (right) tighten up loose sections of the grille.

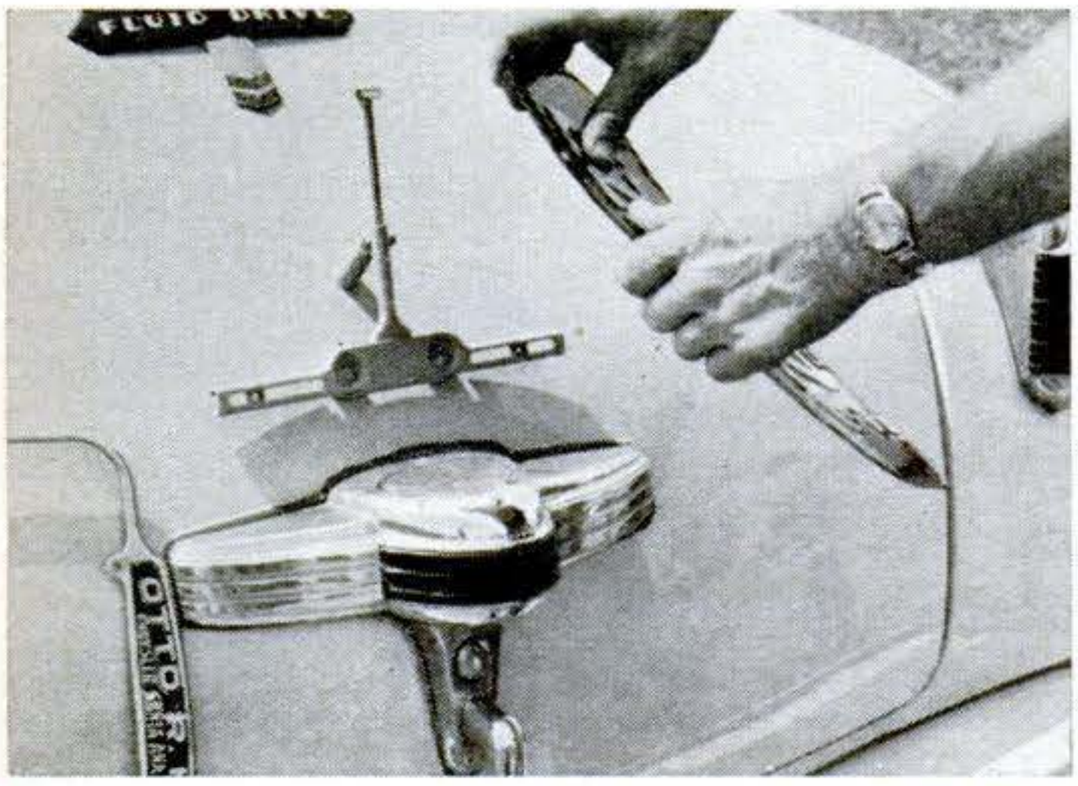




Large wheel disks can be kept from squeaking by cementing several rubber patches on inside surface where disks rub against the wheel.

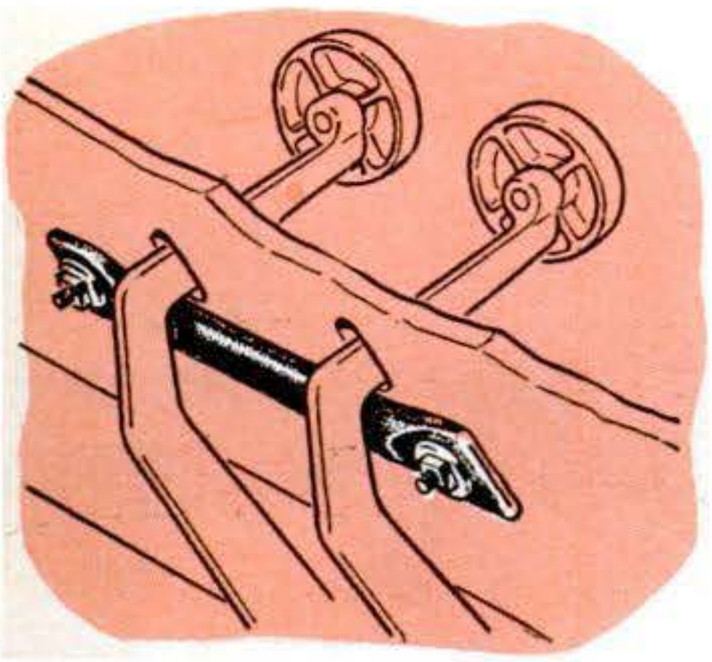


Vibration rattle in a floor starter pedal can be eliminated by stretching a weak spring from the upper part of pedal shaft to the firewall.



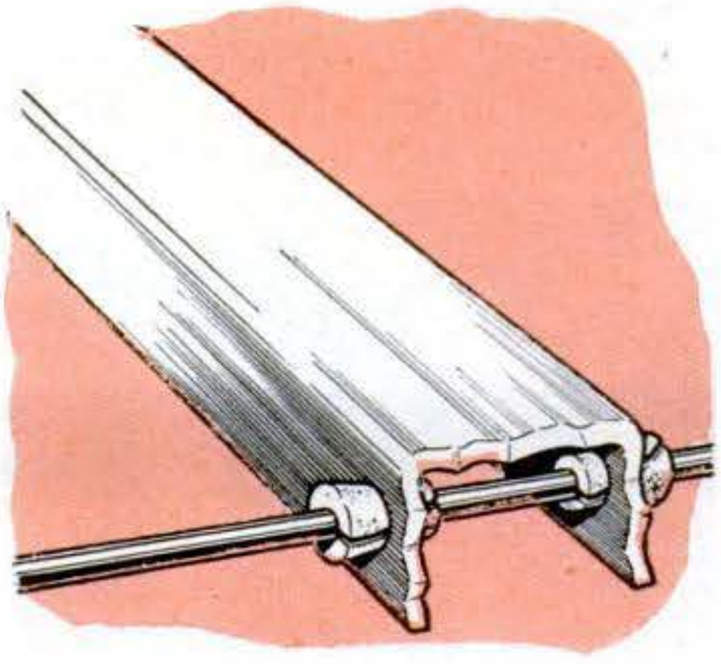
Bending license plate slightly and mounting it in straight frame will usually keep it quiet.

Wrap tools in several folds of cloth. Cement felt padding to inside of glove compartment.



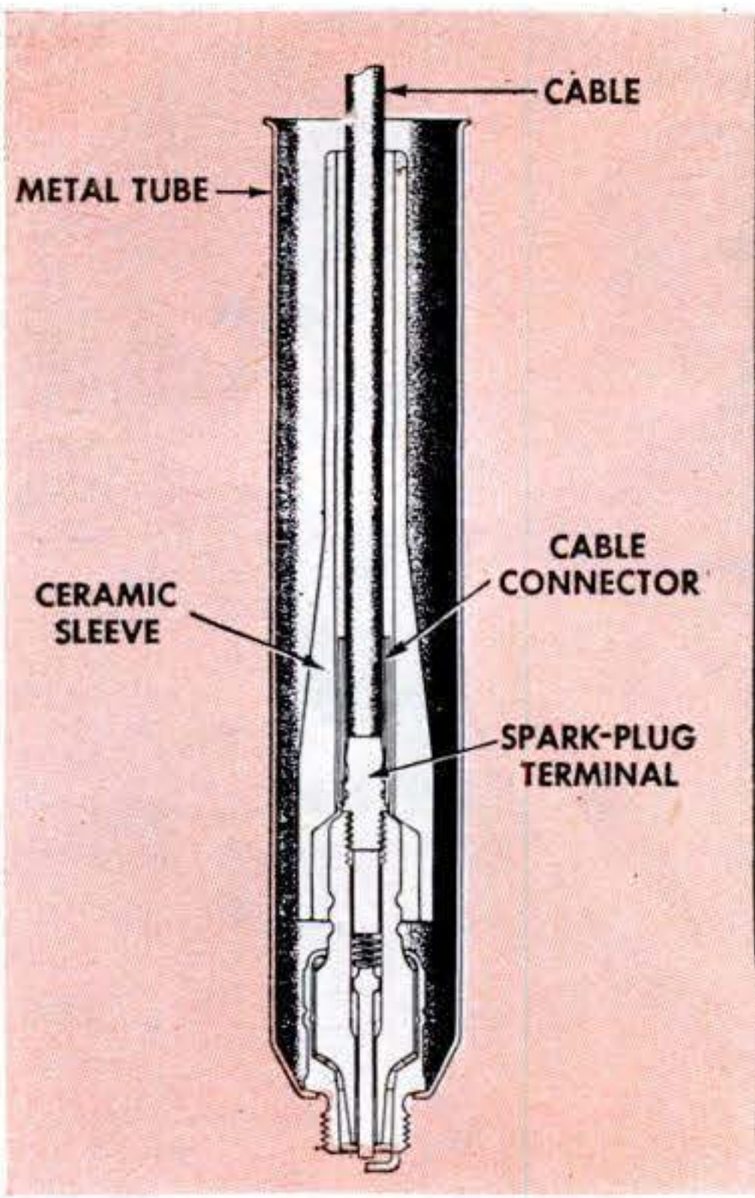
Rubber hose screwed in place as at left will keep pedal bars from slapping the underside of floor boards when you lift your foot. Be sure to maintain free clutch travel or it'll slip.

A cork, drilled, split and slipped over a fuel line or cable where it passes through metal part of car is a good replacement for a rubber grommet that has worn out or deteriorated.

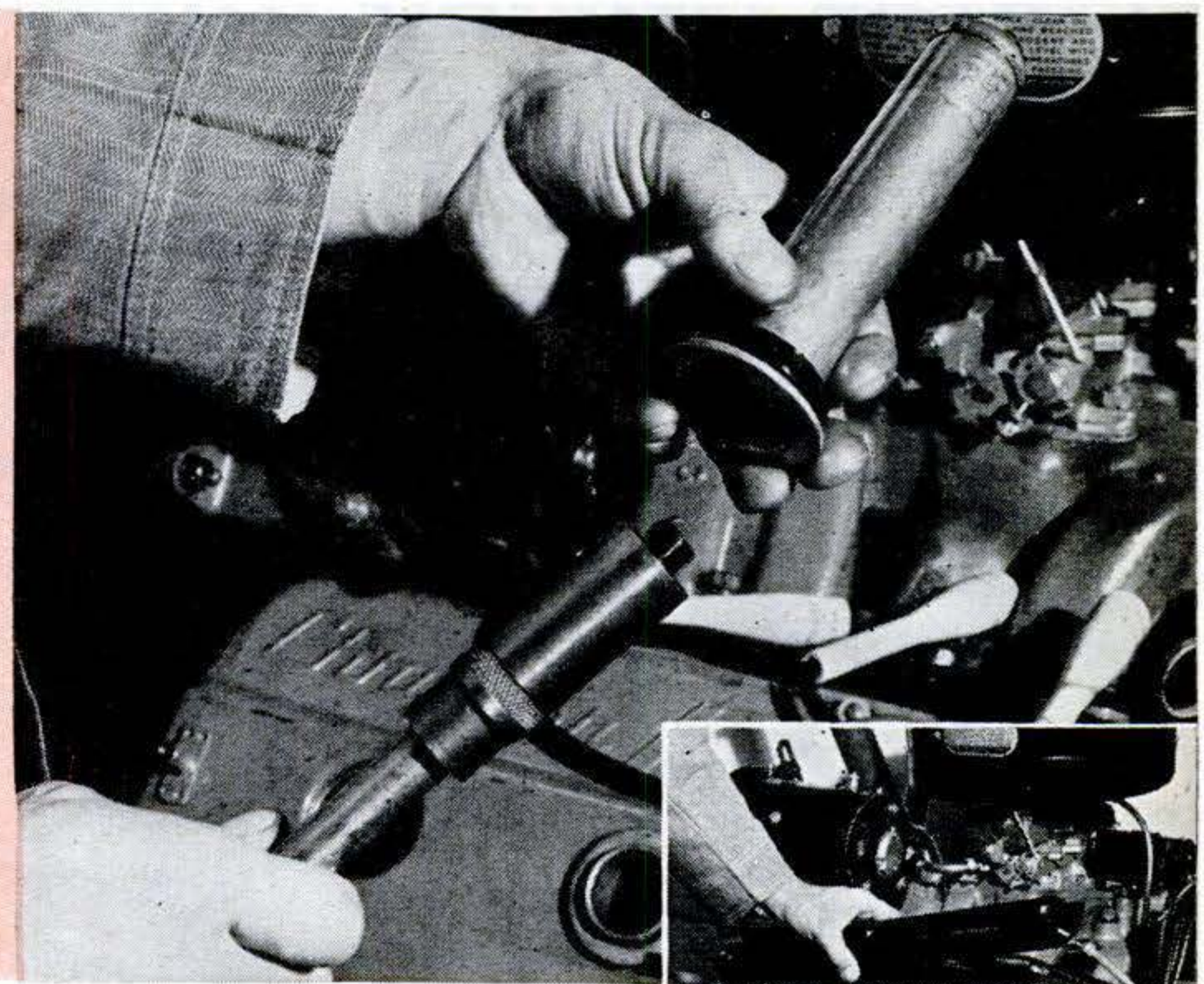


Copyrighted material

Servicing New Deep-Well Spark Plugs



Chrysler V-8 spark plugs rest inside metal tubes that go into cylinder-head wells. Ceramic sleeve surrounds cable connector and plug terminal to prevent flashover to metal tube.



Socket wrench reaches into tube to remove or replace plug. Note ceramic sleeves on wires above. A metal cover (right) shields the wells from dirt and moisture. Screws hold it in place.

CHRYSLER's new V-8 engine introduces a spark-plug installation that requires new servicing techniques. The plugs are at the bottom of deep wells in the cylinder heads.

Wires are removed from the plug terminals by grasping the ceramic sleeves and pulling straight up. The sleeves must be handled gently to prevent chipping. To unscrew the plug, a 13/16" thin-wall deep-socket wrench is inserted into the well. A metal cylinder comes out with the plug.

When plugs are replaced, a torque wrench should be used to turn them up to 30 or 32 foot pounds. This is an important step since standard compressible gaskets are not used.

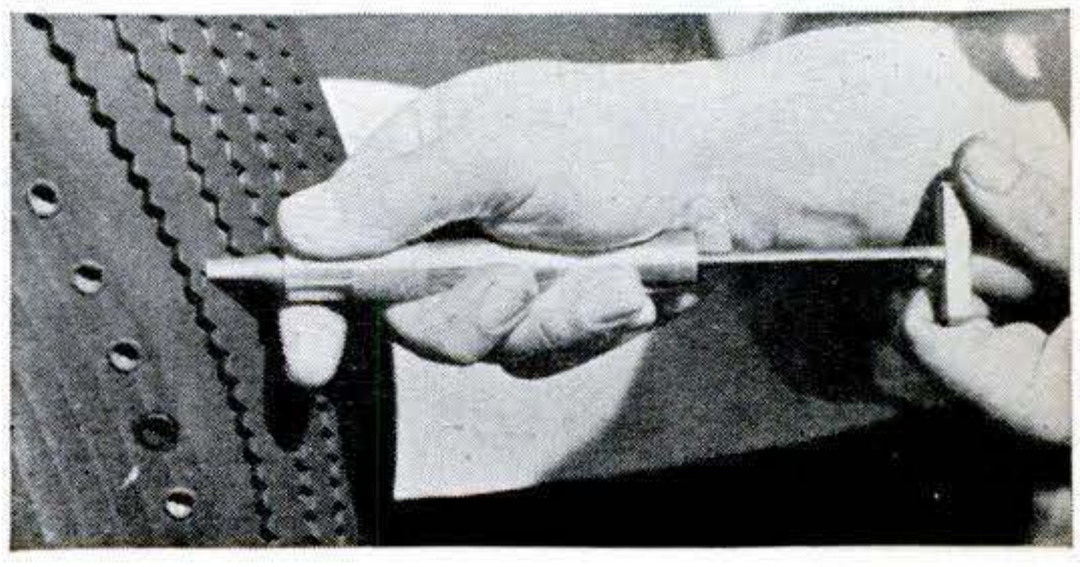
Ironing Pad Handy in a Car

NEXT time the ironing-board pad in your home is replaced, rescue the old one. It does a fine job as a noise-stopping wrap for car tools. And when you have to crawl underneath, it will keep your clothes clean.

Gun Shoots Patch into Tubes

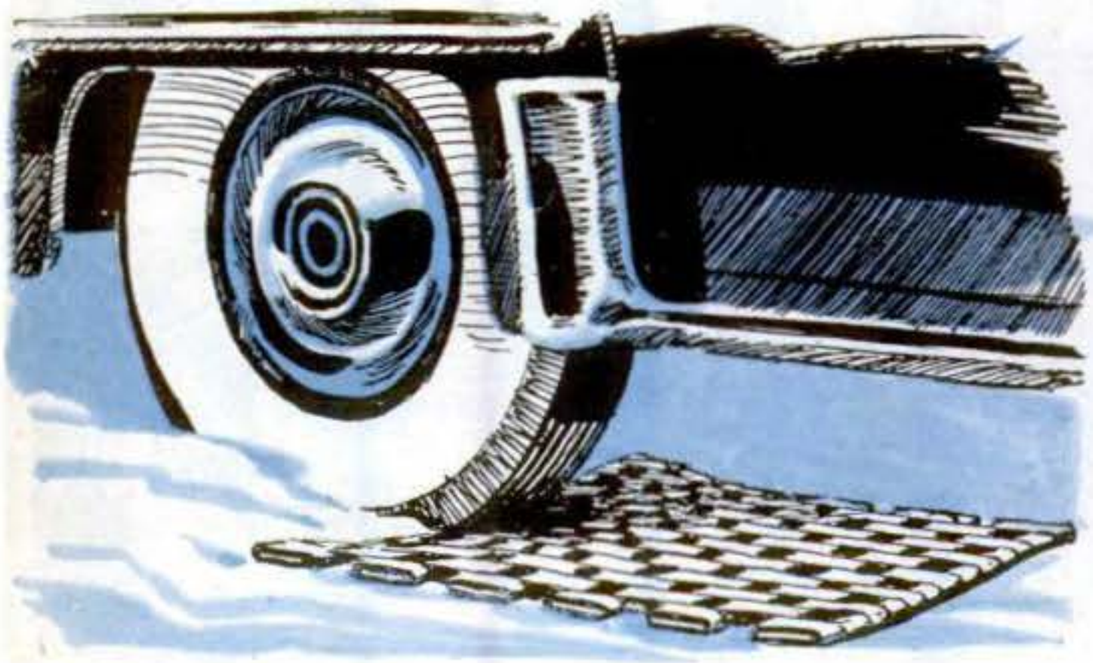
PATCHING a puncture without removing the tube from the tire sounds like wizardry, but that's what a new rubber-shooting repair gun does, according to the maker, Notz-Sweney Co., Englewood, Colo.

Once the nail has been pulled out, the tip of the gun is placed on the hole and the handle turned. This is said to seal puncture holes in both tube and tire.



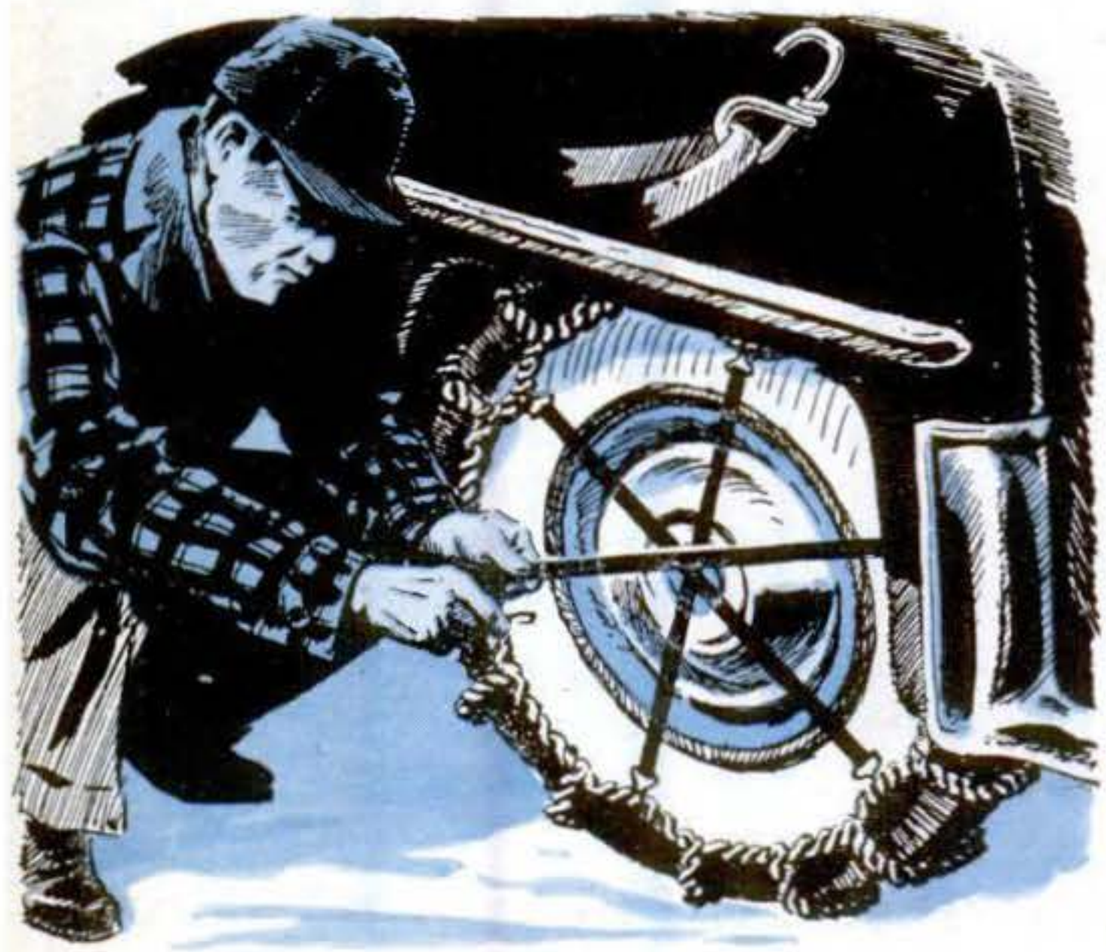
Copyrighted material

Winter Driving Aids You Can Make

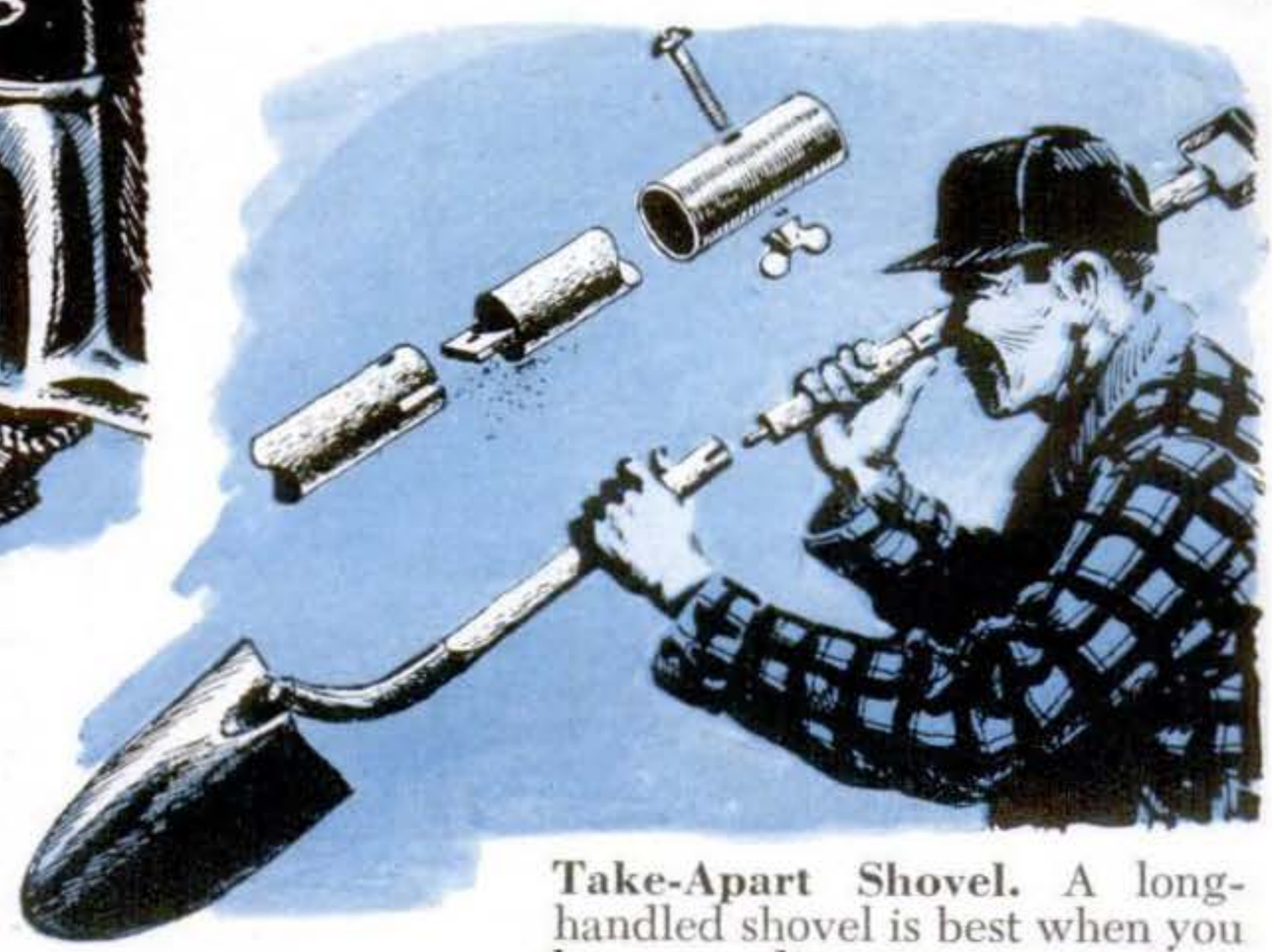


Mat for Traction. Cut a rubber-link door mat in half, store the parts in the trunk, and you'll be able to get going again when you're stuck.

Ballast. If your car needs ballast in back to improve traction on slippery roads, ram thick cement mortar into an old tire. Tire is easier to put in or take out than sandbag, cleaner too.



Chain Tighteners. Cut three bands 1½" wide from an inner tube. From heavy coat-hanger wire, shape two hooked fasteners for each band (see detail above), bending looped ends around band. Stretch bands across wheel and hook fasteners in chain.



Take-Apart Shovel. A long-handled shovel is best when you have to dig your car out. A shovel adapted as shown above will fit into the trunk.

Windshield Scraper. Buy an 8" window squeegee at a hardware store and insert a 24" length of ¾" dowel. The long handle will let you remove snow without getting wet.

Copyrighted material

Undercoating Your Own Car

It's a thrifty job in two ways. You save the cost of having it done, and keep the body metal from rusting away.

By E. F. Lindsley

UNDERCOATING is an extra that an auto dealer often tries to load on when you buy a new car. But you need not dig into your pocket for this extra. You can do the job yourself at a total cost of around $6, and save from $25 to $40.

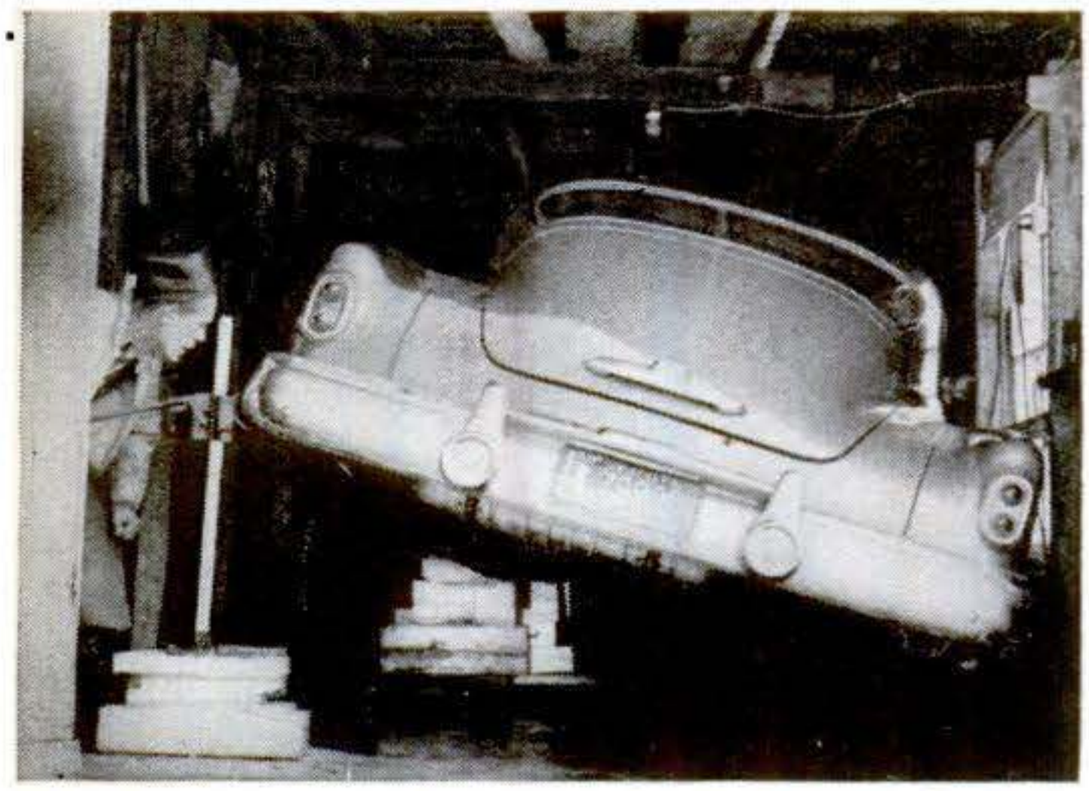
Undercoating has two advantages. First and foremost, it will protect a car by preventing the rust that eats through fenders and body. Secondly, sprayed or brushed into metal-to-metal cracks and crevices, the black asphalt material will forestall many a squeak and rattle.

Most people think of undercoating in connection with a strictly new car, but it's actually a job that pays dividends on one of any age. In fact, it offers a means of curbing rust that may already have gained considerable headway on a car six or 10 years old.

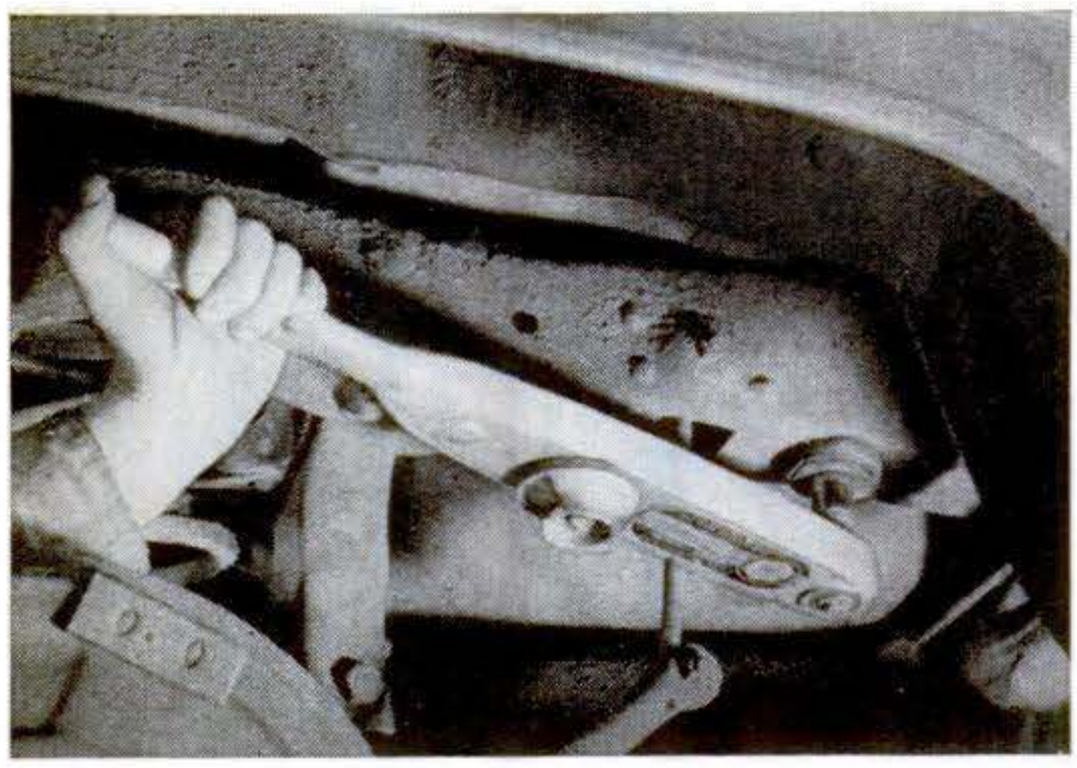
Remove rust. Whether the car is new or old, all rust must be removed and the metal cleaned off before the undercoating

Here's what you need—several cans of undercoater, a wide paintbrush to apply it, a jack, blocks, and brushes and trisodium phosphate to clean off all dirt and grease under the car. Trisodium phosphate is mixed with hot water.

Copyrighted material



Block up car rather than depend on jack. Lift car short distance, place blocks, get another bite with jack. Block car at two points—one forward under engine, second near rear. Canting car sideways lets you reach most points.



Tighten body and chassis bolts as a preliminary step. This is good insurance against rattles and squeaks later. Use torque wrench, if available, checking with service station for the body-bolt torque specified for your car.

goes on. Rust left under the coating would go right ahead with its damaging work. So work on the metal until it shines.

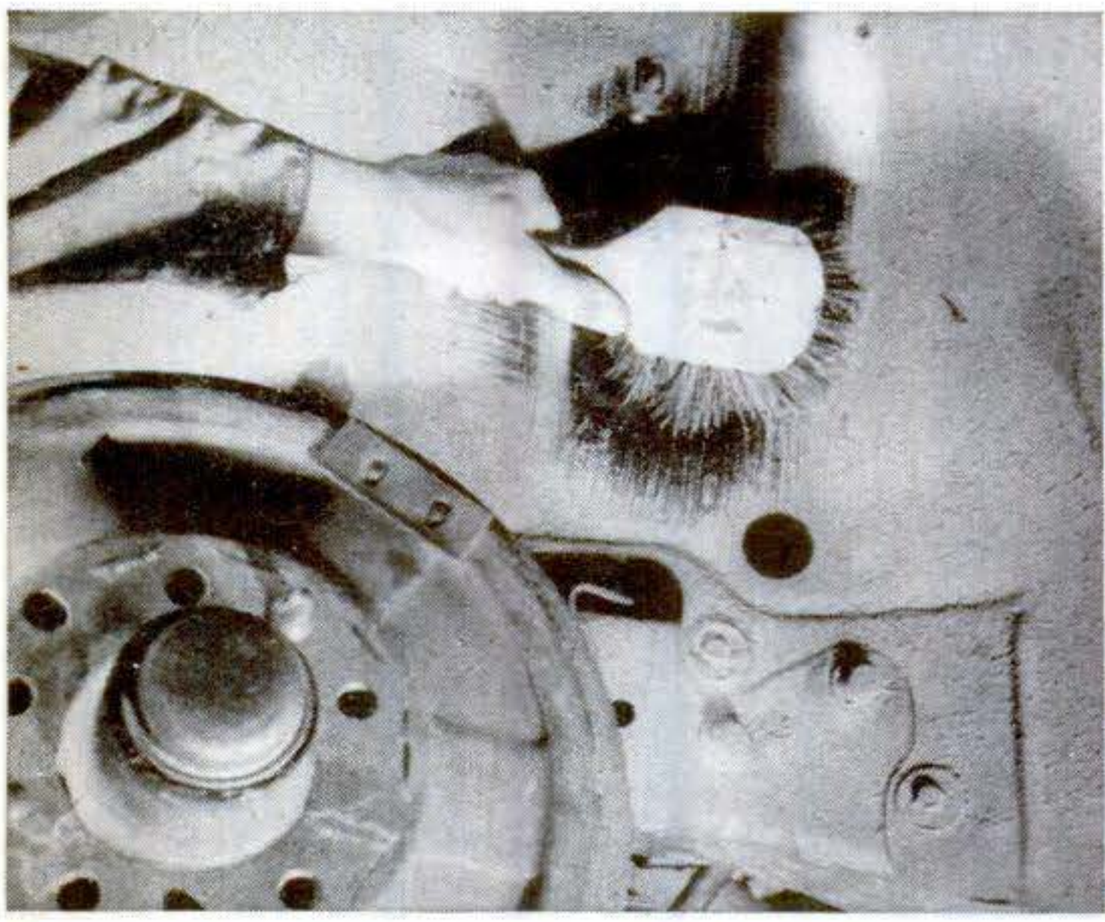
Where do you get the material? Retail stores of the big mail-order houses generally stock undercoating in gallon cans. This sells for around $1.40 a gallon. For the average car, four or five gallons will do the job.

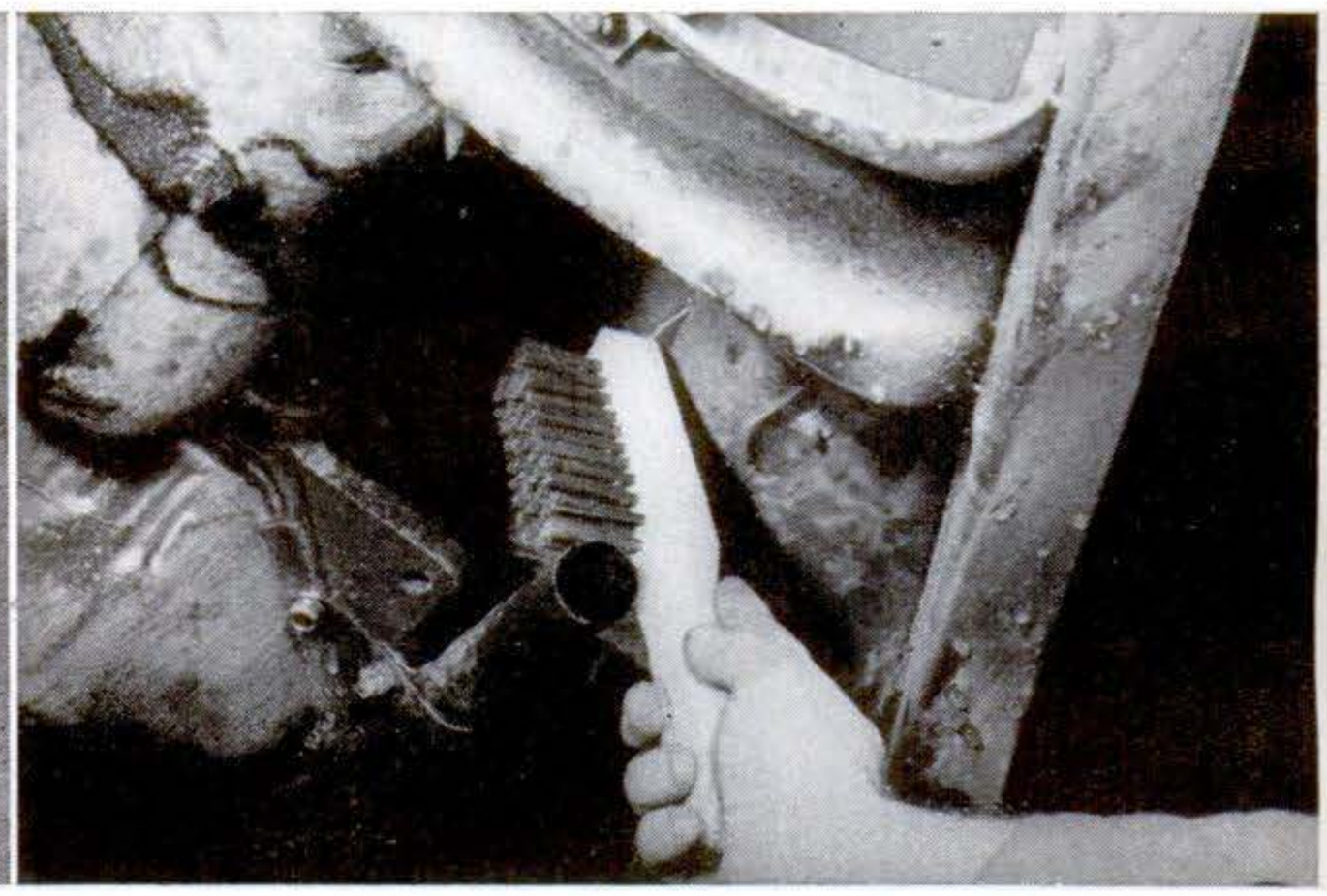
In the shops, undercoating is usually sprayed on. For a single car, you can do it with a brush. The material goes on easily.

Cleaning comes first. I tackled my car after dirt, grime, oil, grease and road tar had been accumulating on the under surfaces for nearly two years. Getting this off is the most difficult part of the procedure.

Steam cleaning is probably the best way to prepare the car. If you can have this done reasonably, it'll save sweat. Instead, I relied on a wire brush (with an attached scraper), a fiber brush and trisodium phosphate to loosen up the grease. Trisodium phosphate is an inexpensive crystalline salt sold in hardware and paint stores for use as a water softener and cleaning agent. Mix it with hot water and daub it on oil and grease areas with a cloth or sponge.

In doing this job it's as important to know what not to coat as what to coat. Keep the material off moving parts of the clutch and shift mechanism, the grease fittings, oil pan, transmission, muffler and tailpipe, brake lines and connections, driveshaft, and rear-axle housing. Apply it liberally, however, under the fenders, on the frame and under





Clean off all dirt. Fiber brush makes short work of loose mud and sand (left). Clay and clinging soil need repeated soakings and hosings. Wire brush removes light rust. Scraper attached to it sweeps off clinging grease and oil (right), after latter areas have been soaked with a strong solution of trisodium phosphate. Steel wool, wire brush or a solvent will remove black chassis paint used on gas tanks and other parts of some cars. Ordinary black frame enamel does not require removal. Allow metal to dry well after cleaning.

Copyrighted material

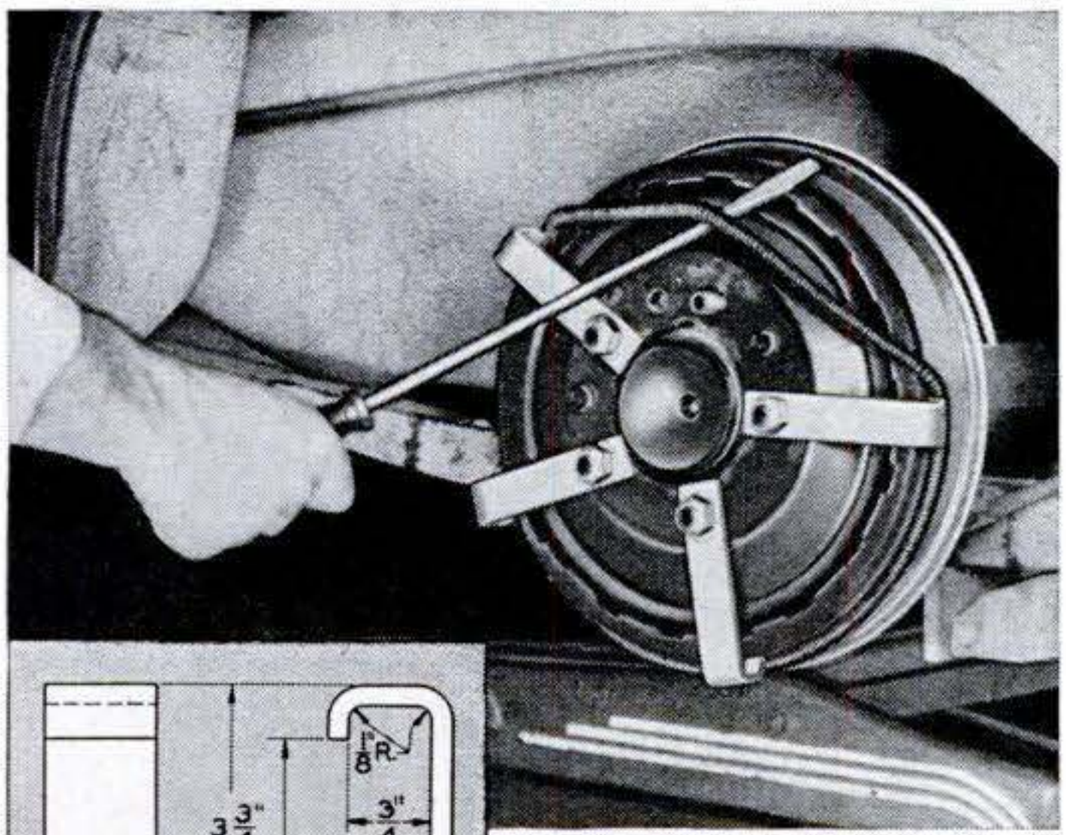
Brush on undercoater in an even, fairly thick coat. A thickness ranging from 1/16" to ⅛" will be fine. If material needs thinning, gasoline or naphtha usually can be used. Apply it under fenders, on frame, floor, gas tank, inside rear bumper, on front and rear gravel deflectors and special fender panels. Hood is a good place to finish off job. Car can be driven within a couple of hours after coating, but overnight drying is better.

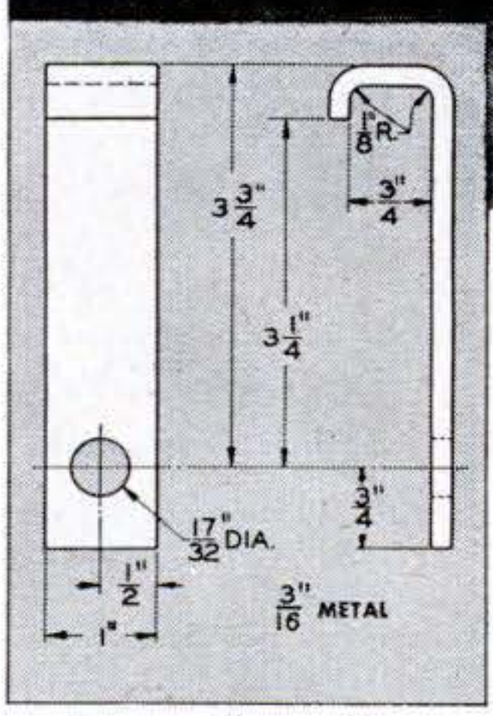
the floor. Under the fenders work it right out to the edge.

Play safe. To get under the fenders, you'll have to remove the wheels. Unless the support is very stable, remove only one wheel at a time. Take no chances with poor jacks or blocks.

Some undercoaters are inflammable while wet. So work with good ventilation—and avoid smoking and open flames. END

Springs Quiet Noisy Brakes





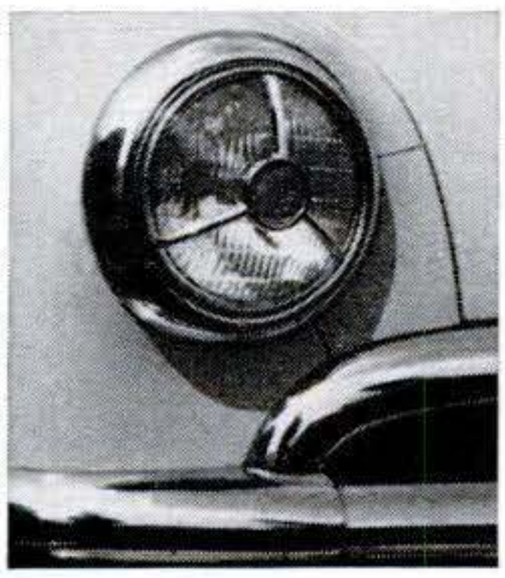
SQUEAKING brakes can often be corrected by stretching heavy coil springs around the drums. Pontiac is now distributing spring sets to its dealers for this purpose. To install the springs, four temporary retainers must be made as shown in the drawing and mounted under the wheel-stud nuts. These retainers are removed after the spring has been secured with small clips that come with the set.

Calking Fills Fender Line

TO LESSEN the chances of rust in the joint where the rear fenders meet the body in my late-model car, I filled the gap with calking compound (knife grade), smoothing it off even. I then let it dry for a week and applied touch-up enamel to the compound. The result looks like a welded seam.—*Frank Radden, Brooklyn.*

Disk Cuts Headlight Glare

CENTERED on a headlamp by three legs that clamp under the retaining ring, this new car accessory is claimed to break up glare from the center filament, with minimum light loss. It consists of a prismatic lens mounted in a chrome band. It's made by Abcone Die Casting Co., Detroit.



Copyrighted material

Gus and the

When stolen bank money begins to show up at the Model Garage, Gus turns detective—without a single clue but a temperamental lumber truck.

By Martin Bunn

"HIYA, Gus."

Gus Wilson looked up from a car radiator he was working on to see the tall, trim figure of a state trooper standing in the Model Garage shop doorway.

"Sergeant Jerry Corcoran," said Gus. "You haven't been by in months. Where the devil you been keeping yourself?"

"Making the rounds as usual," replied the trooper. "Only now I have to cover more miles and more cases—I'm driving a radio car these days instead of a motorcycle."

"Well, glad you finally found some free time to stop by for a chat."

"Sorry, Gus, but this is a strictly official call," Jerry said, grimly.

Gus cocked his head quizzically as he held a match to his pipe. "Can't remember that I've jumped any red lights or knocked down any old ladies recently."

Jerry Corcoran laughed. "No, Gus, it's got nothing to do with you personally, but I think you and some of the other merchants in town can help me if you will."

"Sure thing. What's up?"

Stolen Money Traced to Garage

"Remember that big bank robbery down in the city early this summer?"

Gus nodded. He remembered it only too well. At the time, the papers had been full of the story, telling how three men had forced their way into the City National Bank one night, cracked open the safe and made off with close to $80,000.

"Well," explained Jerry, "the Feds think that job was masterminded by the same guy who's pulled at least four other big hauls—all of them safe-cracking jobs. And what's more, the Feds have a hunch he's hiding out around here."

"How come?" asked Gus.

"Some of the money has been turning up in the daily deposits here at the bank—they know the serial numbers of most of the stolen bills. As a matter of fact, Gus, several have turned up in money you've deposited in the last few weeks."

"In *my* deposits?"

"Don't worry, Gus," Jerry grinned, "but it does mean that the guy we're looking for may be one of your customers. Been working on any strange cars lately?"

No Clues to Go On

"Now look, Jerry," said Gus, "you know as well as I do that all kinds of cars pull into a roadside garage. People stop for gas, they want their oil changed, they have a flat they want fixed. Sure, most of our business comes from the townspeople, and we know them. But every day we service dozens of cars we've never seen before."

"Yeah, I know," replied Jerry, "and the heck of it is that according to the flimsy descriptions we've got of this guy he looks just about like everybody else—no distinguishing features—just a Joe Doaks. All we're reasonably sure of is that he's about 40 years old and has dark hair. We also know that he does a pretty good disappearing act between heists."

"Not much to go on," said Gus.

"You're telling me?" Jerry groaned. "And he's all mine—to find, that is. The captain put me in charge of the case this morning. Said it would mean a citation, or maybe even a promotion, if I can come through."

Gus and Stan Check Bills

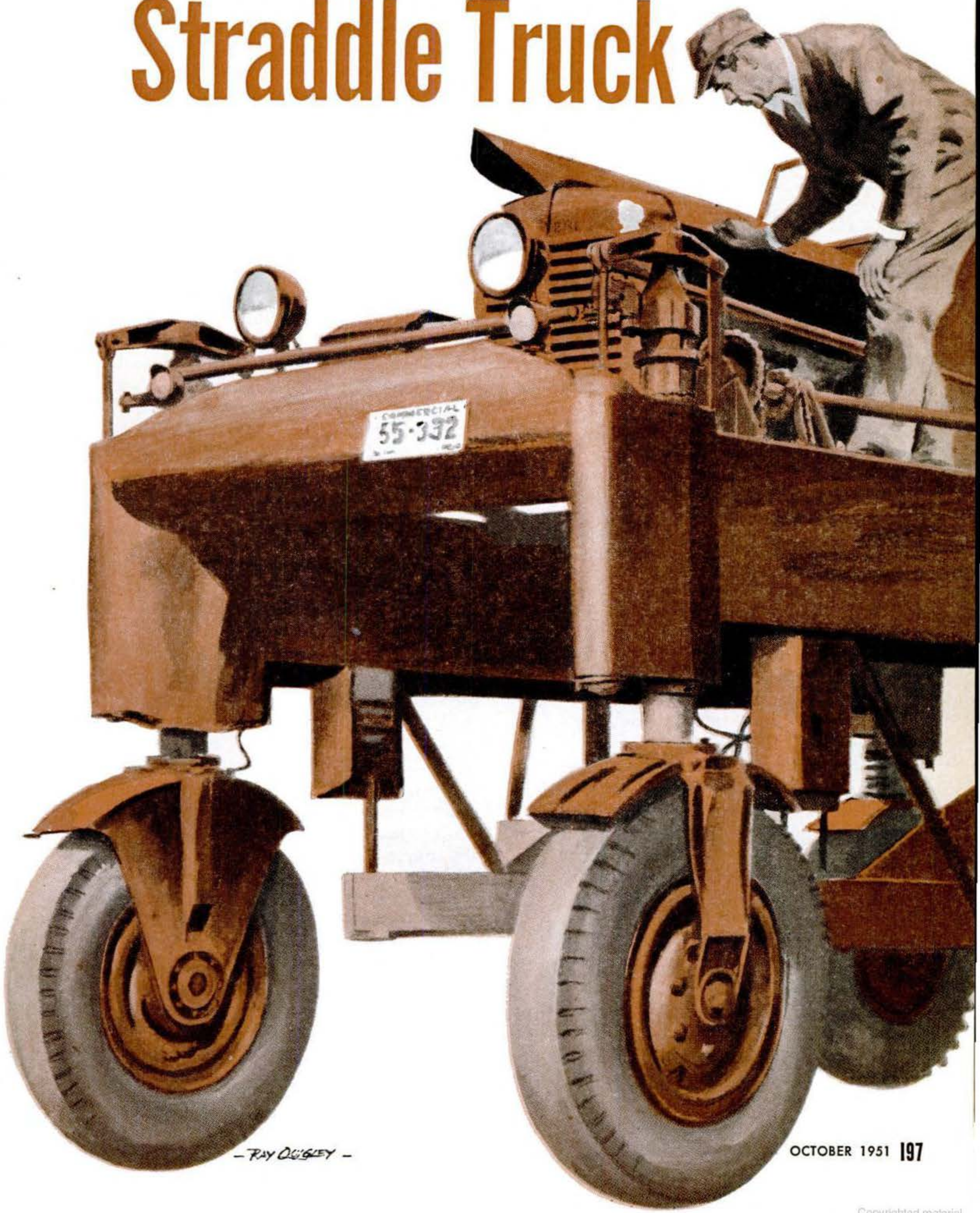
For the next few weeks, Gus and Stan Hicks, Gus's helper, paid close attention to all strangers who stopped at the Model Garage. They were leary of all bills and checked them against the list of serial numbers Jerry Corcoran had left with them. Luckily, the numbers fell into sets of continuous sequences so checking was largely a matter of memory.

More than once Stan or Gus thought they had a suspect—judging from a driver's looks—but each time the number on the bill failed to check and the suspect turned out to be no one more dangerous than a road-weary sales-

Copyrighted material

Missing Straddle Truck

Gus peered under the open hood while Frank maneuvered the big straddle around the mill yard, picking up lumber. Again there wasn't a hint of a miss.



Copyrighted material

man, a casual tourist, or a visitor in town on legitimate business.

But Gus and Stan continued to be suspicious of every driver of a strange car. Gus was in the garage office late one afternoon making change for Stan when he heard a car drive into the adjacent repair shop. Looking out through the open office door, he saw a blue pickup truck ease to a stop beside the repair bench.

"Never saw this truck before," Gus thought as he walked toward it.

Just then, the door popped open and a dark-haired man wearing a bright plaid lumber jacket stepped out.

New Truck Is Just a False Alarm

"Don Thatch," Gus called when he realized that the driver was the owner of the local sawmill and our biggest lumberyard. "That truck had me guessing for a moment. Didn't recognize it."

"It's new; bought it about six weeks ago," said Thatch. "Had to do something. That old one was falling apart."

"Satisfied with this one?" asked Gus.

"Pretty much," Thatch replied. "Right now, it's about ready for the final checkup and I'm hoping you'll be willing to give it a going over. It'll save me a long trip into the agency in the city."

"Do what we can," said Gus. "Any particular complaints?"

"Well, she's uneven as the devil when she's idling, but I know you'll take care of that. When can I have it?"

"Well, I'm near ready to close now. How about around noon tomorrow?"

"Swell, I'll have one of my men pick it up. Oh, by the way, could you stop out at the mill someday soon? One of the straddle trucks we use for hauling lumber is giving us trouble. The driver claims it's got a bad miss but the new handyman-mechanic claims there's nothing wrong."

Gus thought for a moment. "Tell you what, if we're not too jammed up here tomorrow afternoon when your man comes I'll ride back out with him."

Gus Meets an Odd Character

When Don Thatch's man showed up shortly after noon the next day, the pickup truck was ready and waiting.

"You riding back with me?" the man grunted.

"That's right. Understand Don's been having some trouble with one of his straddlers."

"Wouldn't know," the man grumbled as he raced the truck's engine impatiently.

The ride to the mill was made mostly in one-sided silence. Gus tried to make conversation, but when he found that all he could get out of the man were grunts, he gave up.

Don Thatch was just coming out of the door when the pickup pulled up in front of the mill office. "Glad you could make it, Gus," he said. "That straddle truck I told you about is parked over in front of the repair shop. Let's go around."

Driver Bears Watching

"Odd sort of character you've got driving your pickup," said Gus as he followed Thatch around the corner of the office building. "Does he ever say anything?"

"Don't know much about him," said Thatch. "Hasn't been on the payroll very long. Keeps pretty much to himself. Good worker, though, so I can't kick."

As they walked along, Gus made a mental note to let Jerry Corcoran know about the pickup driver.

The repair shack was a squat two-story affair and parked beside it was the big orange beetlelike truck with its engine and driver's seat perched high up on the four stiltlike legs that rolled on wheels.

Don stuck his head inside the door of the building. "Ned," he called, "will you come out here for a minute?

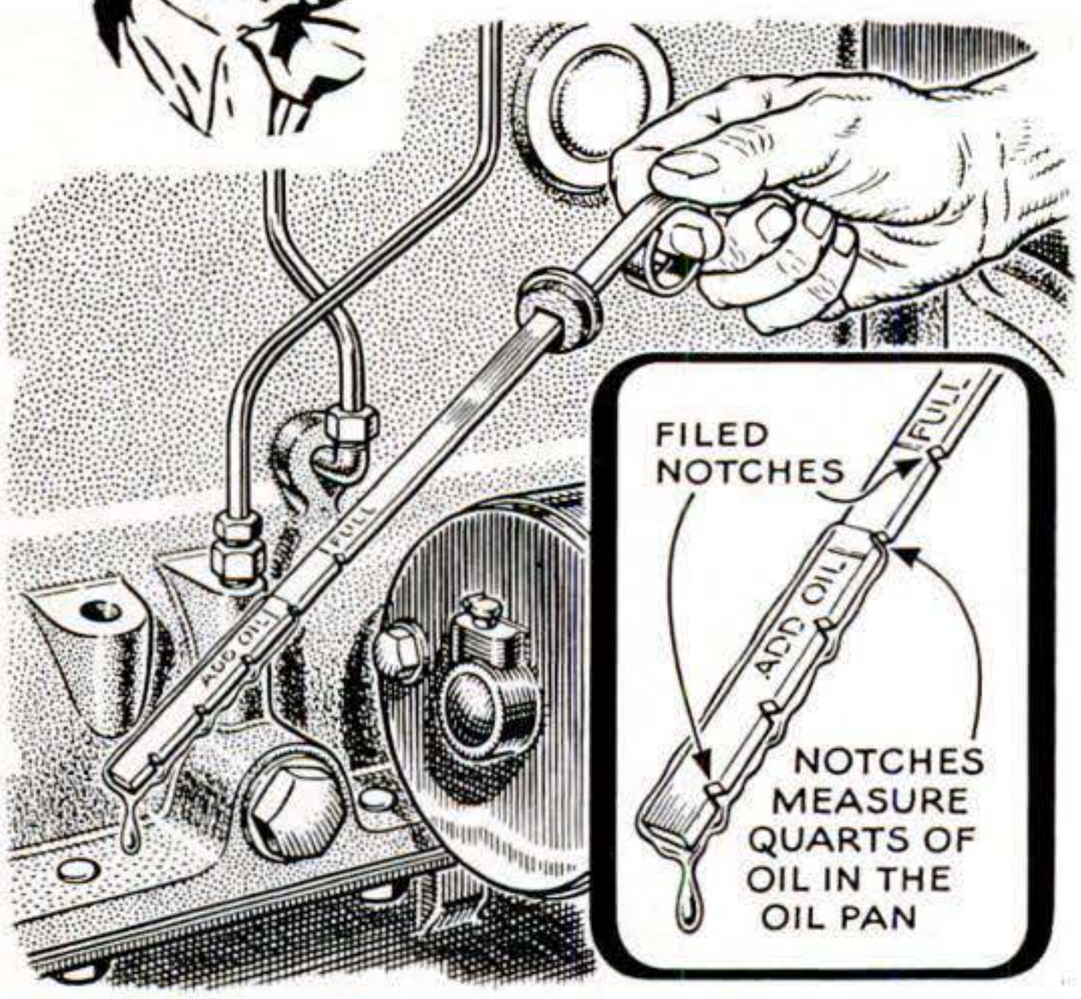
"Meet Gus Wilson, Ned," Thatch said as a wiry, fair-haired man joined them. Then he added, "Well, I'll be getting along and see if I can locate the driver."

"Glad to meet you, Mr. Wilson," the fellow grinned as he rubbed his hands on the leather welder's apron he was wearing. "Mr.

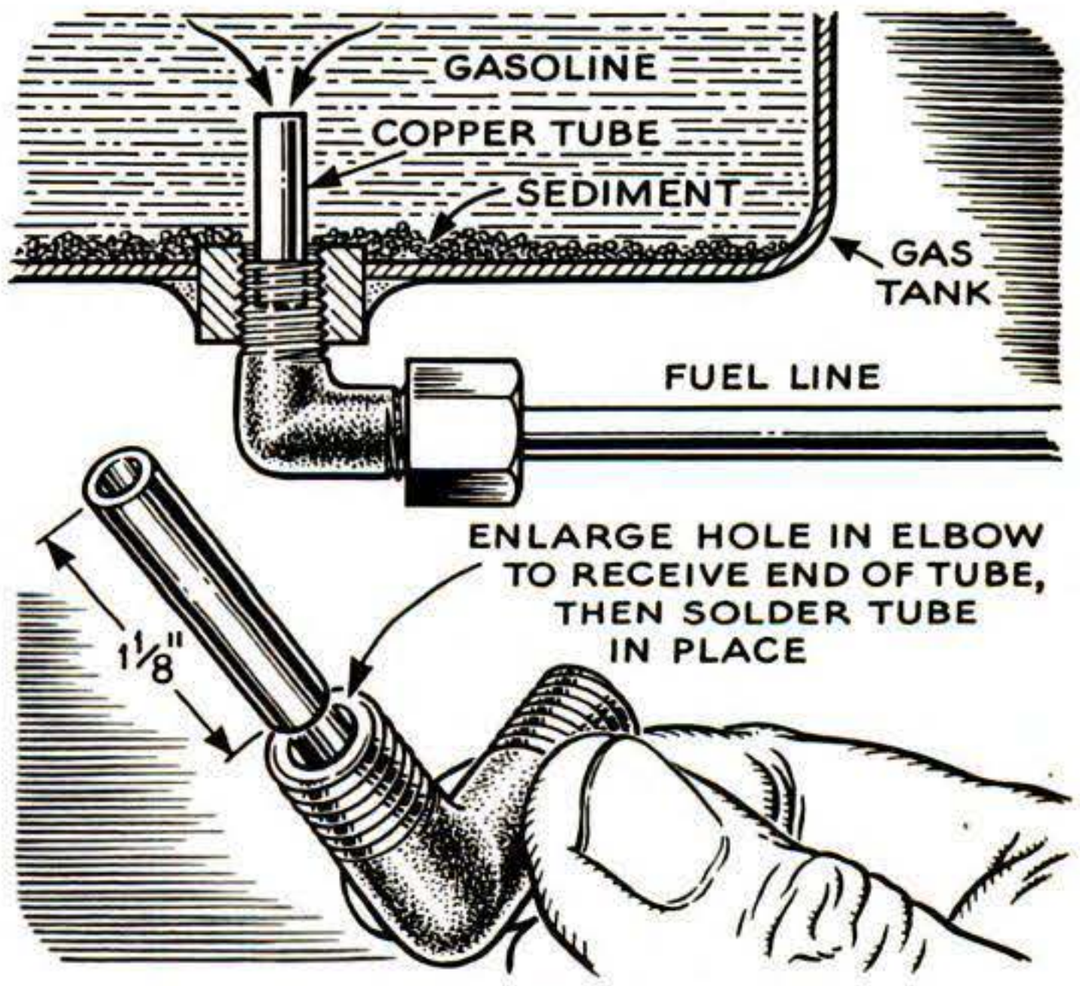
[Continued on page 254]

Copyrighted material

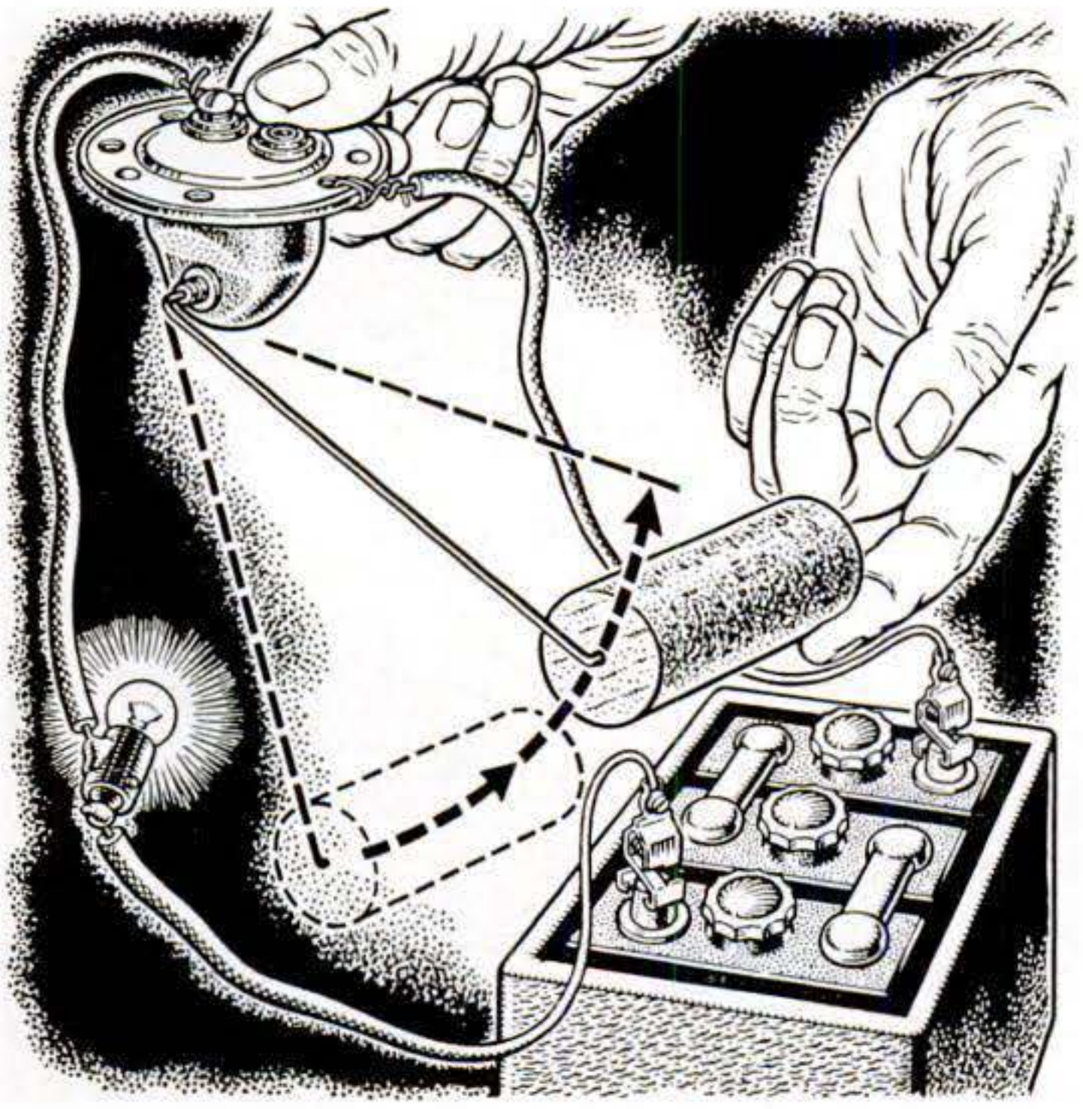
Hints from the Model Garage



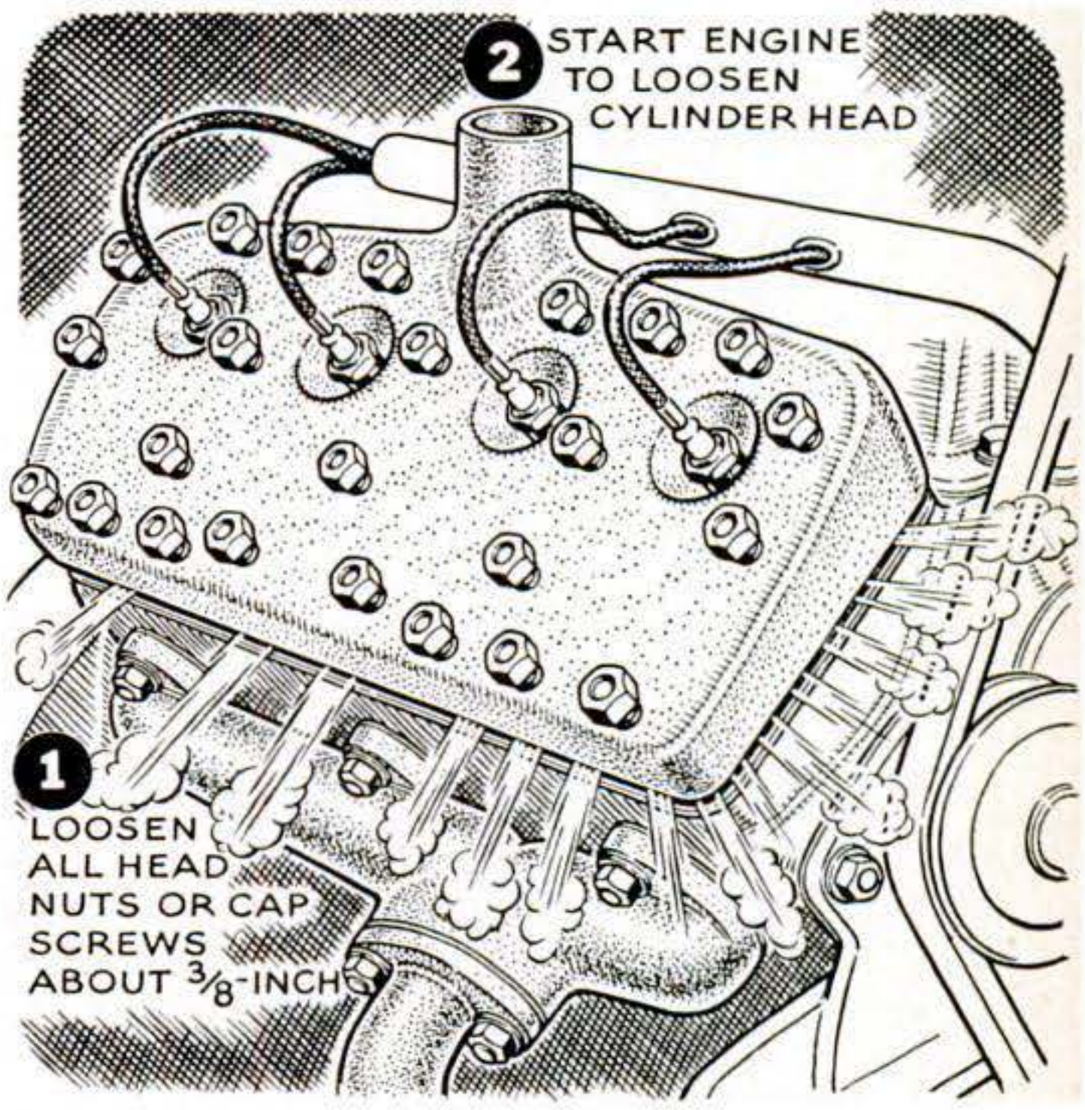
File Marks Measure Oil. Next time you change oil, add the new oil a quart at a time and file a mark on the dipstick for each successive level. Your stick will then give an accurate check in quarts.



Keeping Gasoline Clean. Trucks, tractors and older cars sometimes have the outlet at the bottom of the tank. A piece of copper tubing installed as shown above will help keep dirt from the line.



Testing Fuel-Gauge Tank Unit. You can check the rheostat in the tank unit of a fuel gauge by connecting it in series with a small six-volt bulb and then working the float arm. With the float in empty position, the light should barely glow. As you raise it, the light should steadily increase in brilliance.

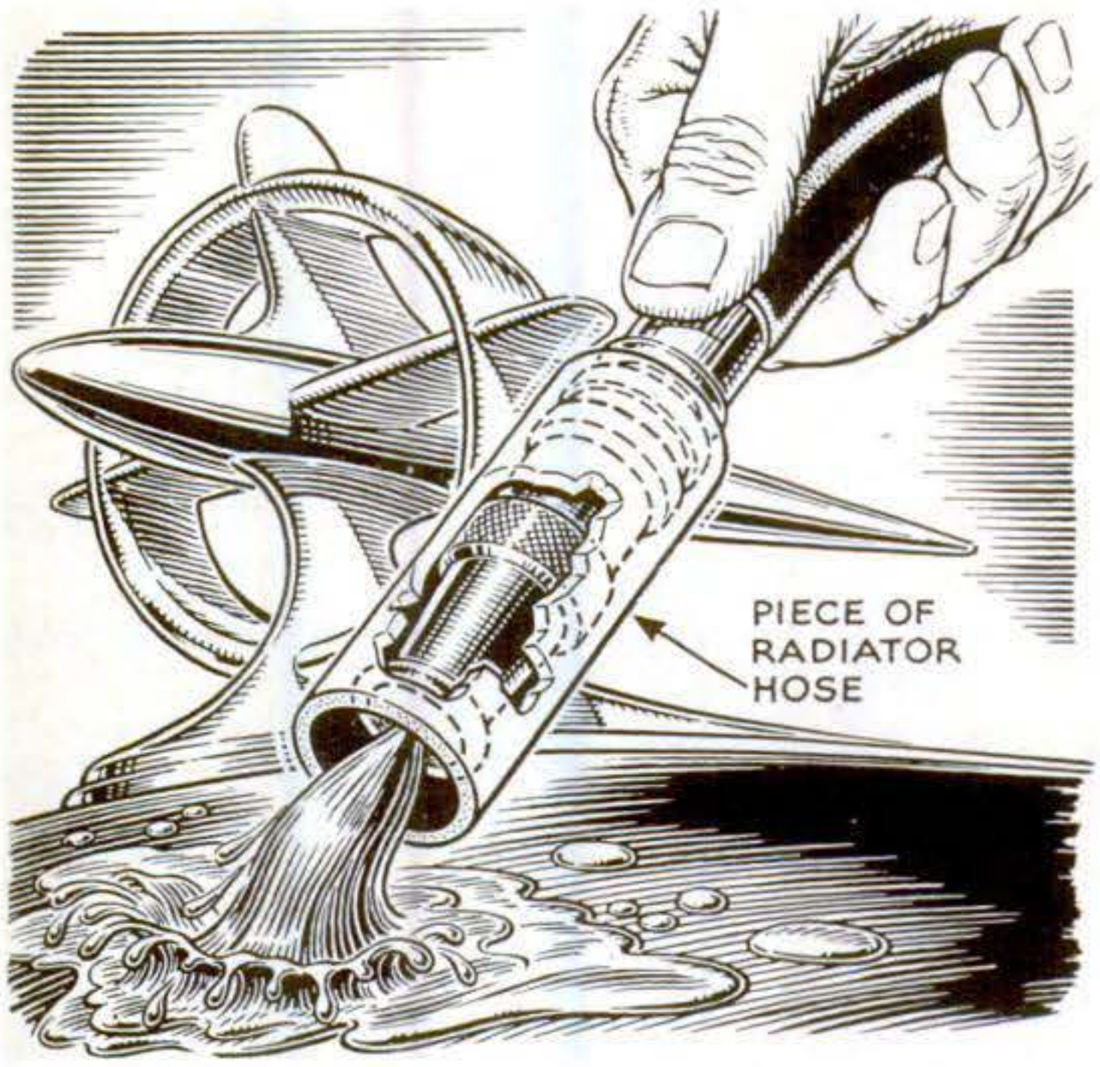


Blowing a Head Loose. Because V-type engines will run on one bank, there's a simple method to loosen stuck heads. Back off the bolts on one head about ⅜", leave the spark wires connected, start motor, and head will blow loose. Then tighten this side down, back off the bolts on the other side and run the motor again.

Turn the page, please, for four more auto hints.

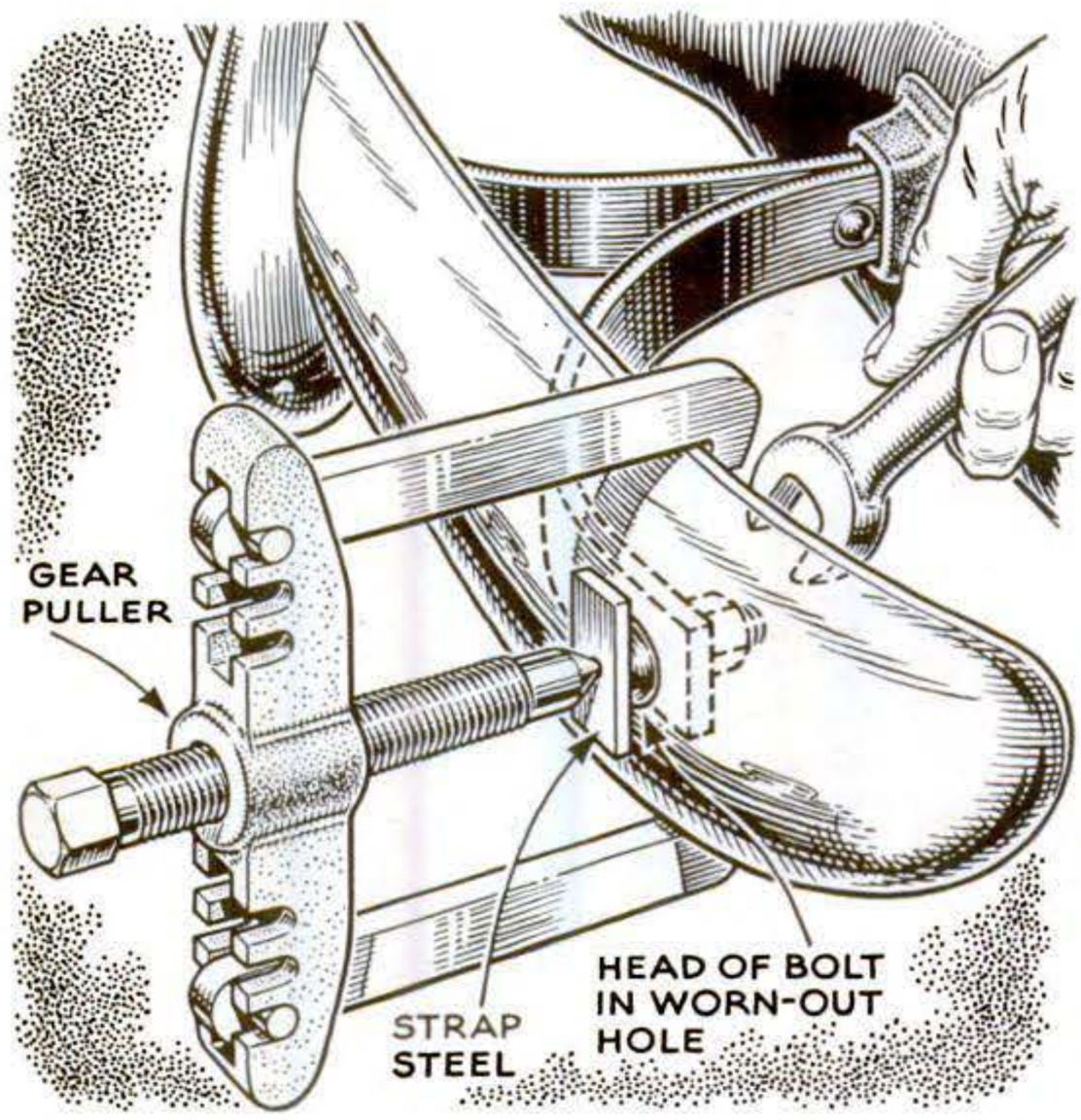
Copyrighted material

MORE Hints from the Model Garage

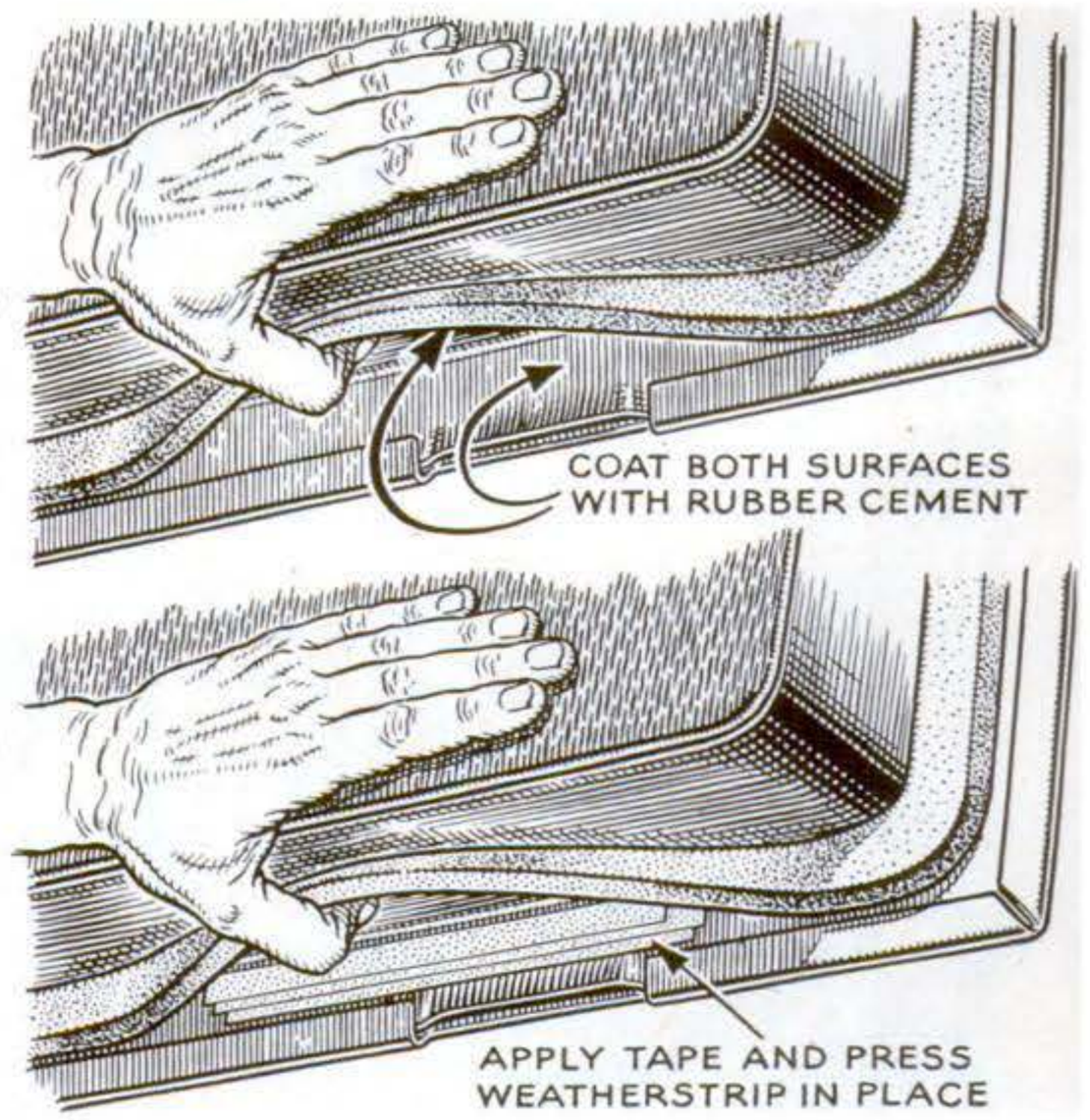


Hose on Nozzle Avoids Scratches. If you use a garden hose with nozzle to wash a car, the nozzle may slip from your hand and mar the paint. As a safeguard, slip a piece of radiator hose snugly over the nozzle. Turn this to adjust the spray.

Special Wrench for Head Nuts. A long T-wrench made as shown here can save lots of time in removing head nuts or cap screws on V-8 engines. Use one hand as a bearing for the shank and spin the handle rapidly with the other hand.



Tightening Bumper Bolts. If a square locking hole in a bumper has become so worn it won't hold the bolthead, assemble a two-jaw gear puller and a steel pad as shown here. (The pad keeps the puller shaft from chewing into the bolthead.) Turn the puller screw down tight and you'll be able to loosen or tighten the bolt as desired.



Replacing Weather Strip. When rust on the edges of a car door loosens the weather strip, try this. Coat both the strip and metal with rubber cement after brushing off the rust. Between the strip and metal, sandwich several layers of double-faced cloth adhesive tape (such as Bauer & Black Polyken No. 105). The strip will then hold.

Copyrighted material

How to Judge Used Power Tools

You have to look under the paint to spot quality. Here's the first of two articles on how to get a good buy when horse-trading for machines.

By Darrell Huff

LOOKING for a secondhand drill press, saw or lathe is like shopping for a used car. Just peering under the hood isn't enough. There are certain rather specific things you need to know in order to tell a sound bargain from a shiny lemon.

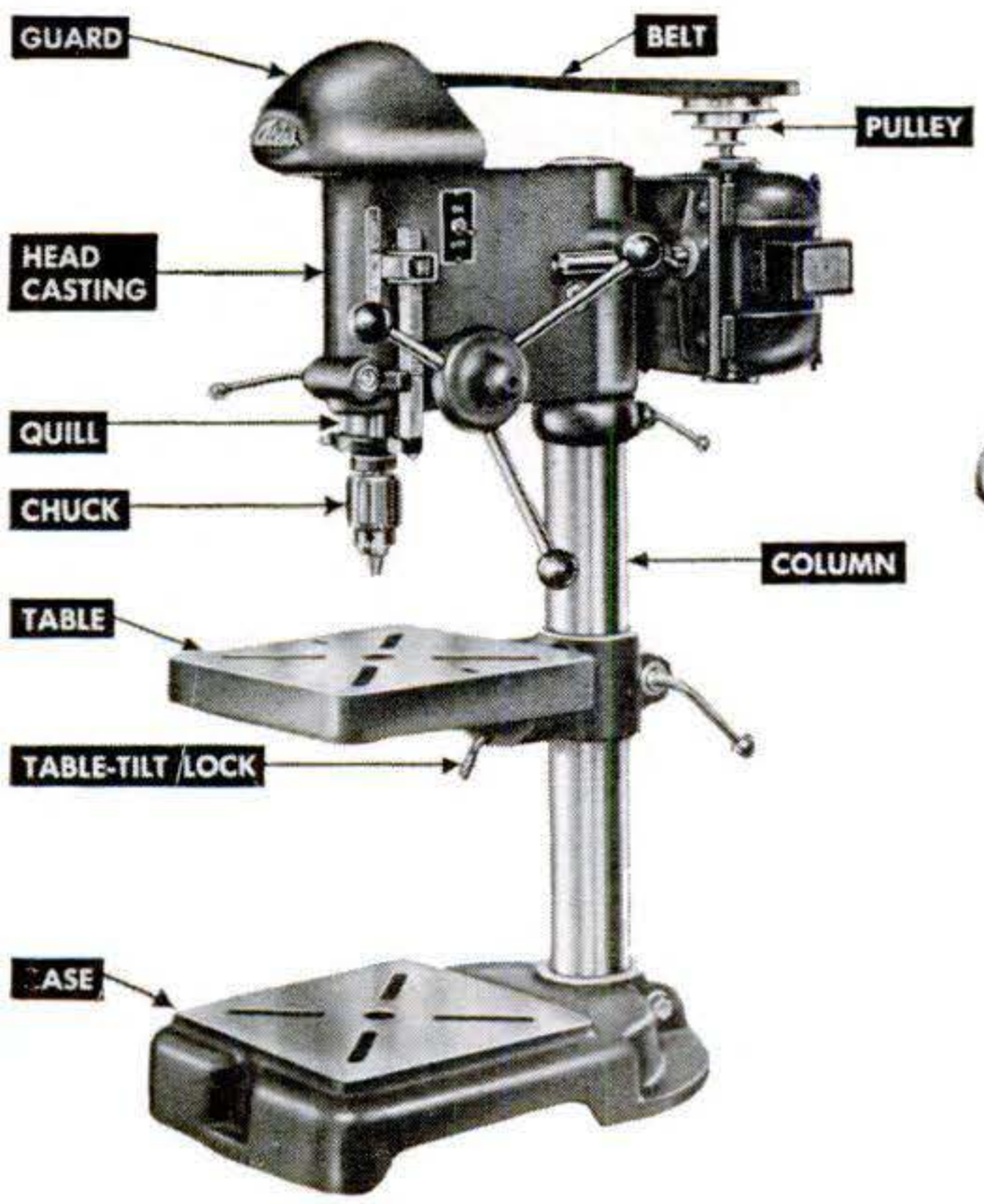
There are a few general points, too. The first is the name of the maker. Is he known for good tools? Is he still in business? There's nothing more annoying than owning an orphaned tool with a broken-down bearing that can't be duplicated.

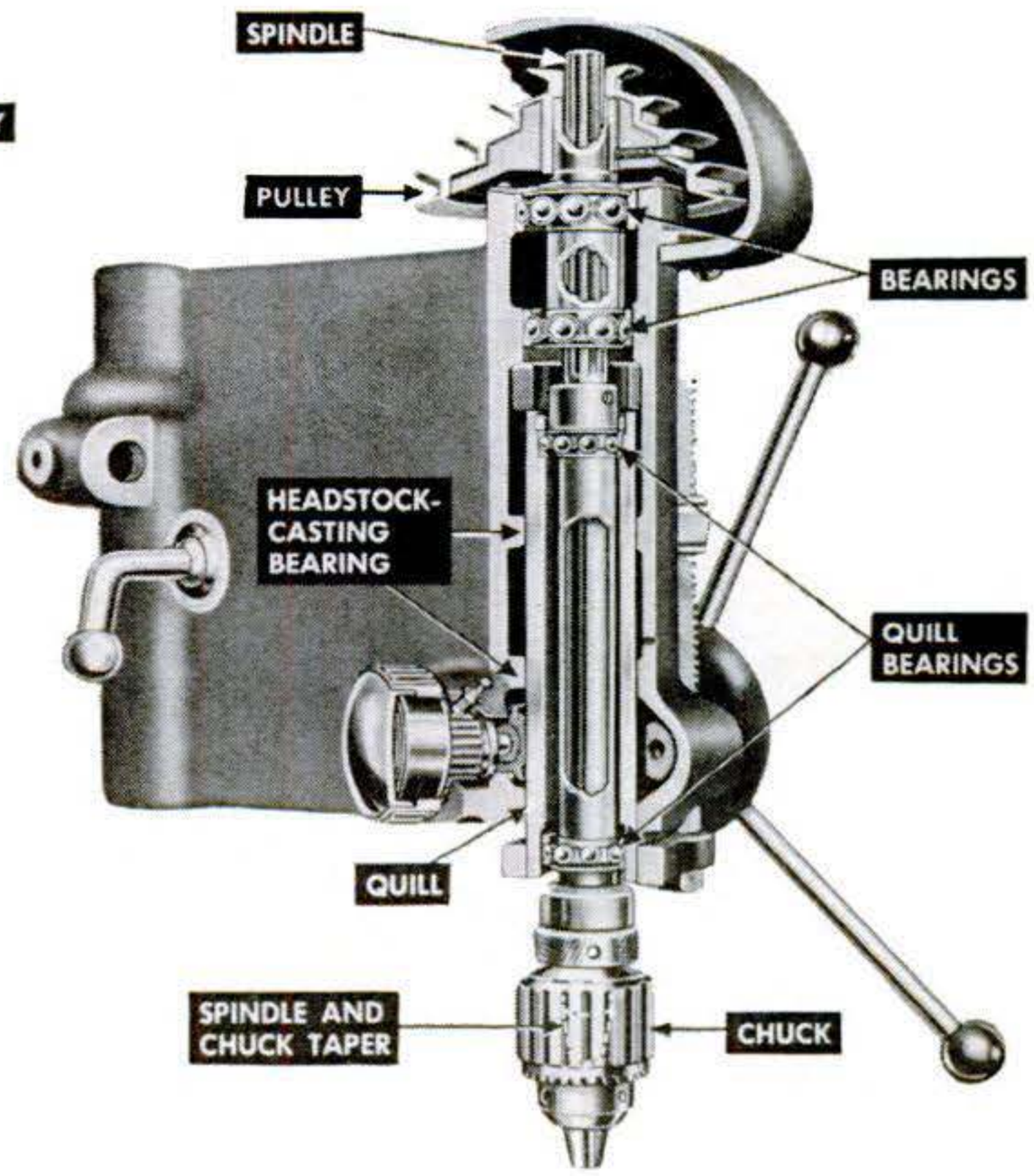
Note whether the tool is of the manufacturer's first-quality line or something designed for light home use. The latter may do you very well, but you want to know what you're getting when you begin to talk price.

Don't overlook accessories. The seller of used equipment is likely to have accumulated a good many of these at considerable cost. A used drill press offered at the original retail price may be a bargain if such items as a full set of drills and a mortising attachment are thrown in. An 8″ dado head and some blades may cost as much as a medium-priced table saw.

Drill press: Watch for cracked castings and worn bearing housings

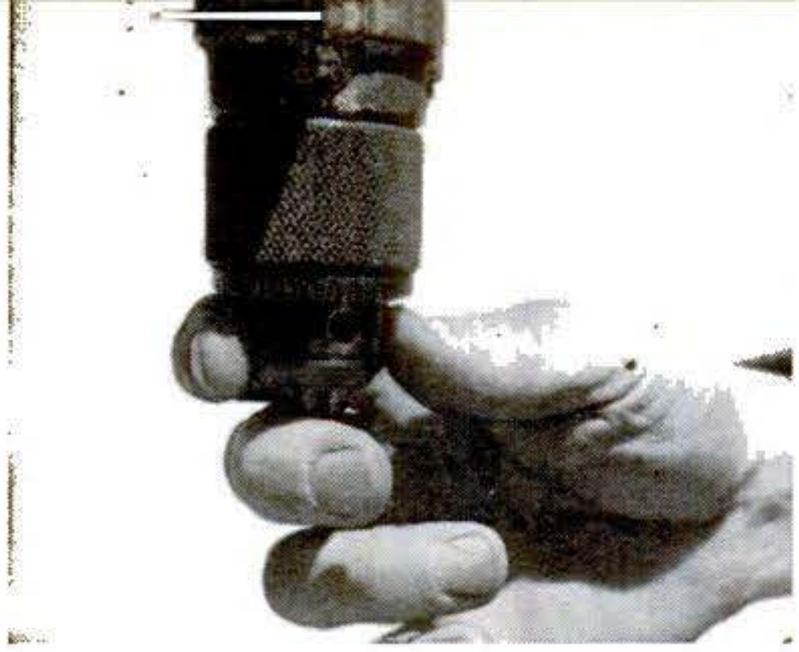
FIRST question is suitability. Is it rugged enough for the work you have in mind? Is it big enough—in distance from center of chuck to column? (This is how the size of a drill press is measured. A small, home model such as the 11¾″ will drill a hole in the center of any circle up to 11¾″ diameter.) Is the spindle travel long enough to suit your pur-





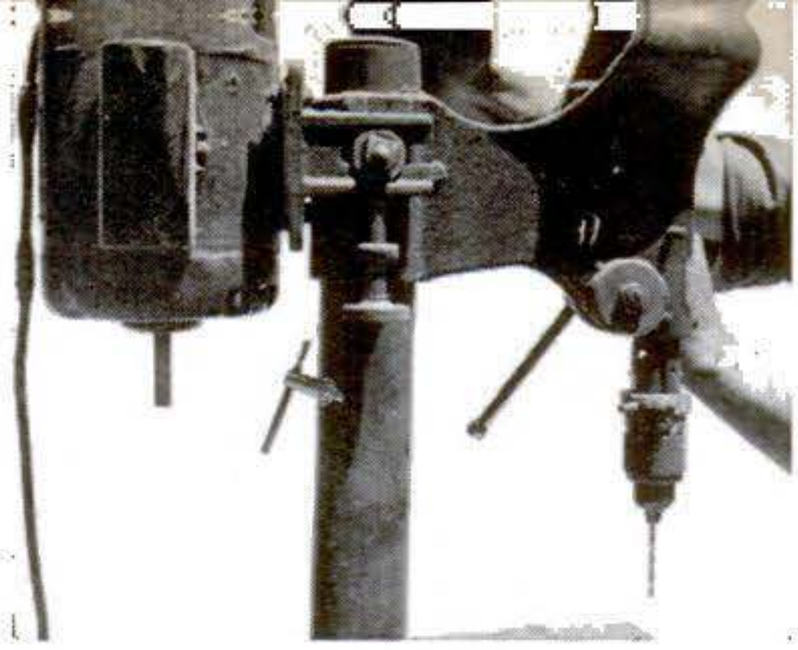
Major check points on a drill press are shown at left. If you could get inside the head casting, you'd see parts shown at right. Most wear occurs here, especially in the bearings.

Copyrighted material



Run quill down (left) and try to move it back and forth by hand. Watch out for too much lateral play at this point.

Test the chuck for wobble by putting a new drill in it and turning it by pulling on the belt (right).



poses? When you have answered these questions, you are ready to do some checking on the machine itself.

1. Is there lateral play between the quill and the headstock casting? Run the quill down and try to move it back and forth with your hand. If there is noticeable play, better just walk away with your wallet still in your pocket.

2. If the drill press has a tapered spindle, is the taper undamaged?

3. If there is a chuck, is it still accurate? Put a new drill into the chuck, and turn the spindle by hand. If the chuck is good, the drill won't wobble. If it does wobble, you may have to buy a new chuck. Typical price: $7.60.

4. Are the pulleys worn or cracked? If there are shiny spots on the bottom of the pulley Vs, add a couple of dollars for replacement to the price asked for the drill press.

5. Any cracked castings? These generally have to be replaced, and they are pretty expensive items.

6. How does it run? This, of course, is the crucial test, and if you have to buy without making it you are taking a big gamble. The best you can do in that case is to turn the spindle by hand. It should turn freely, without the gritty feeling or sound that indicates bad bearings.

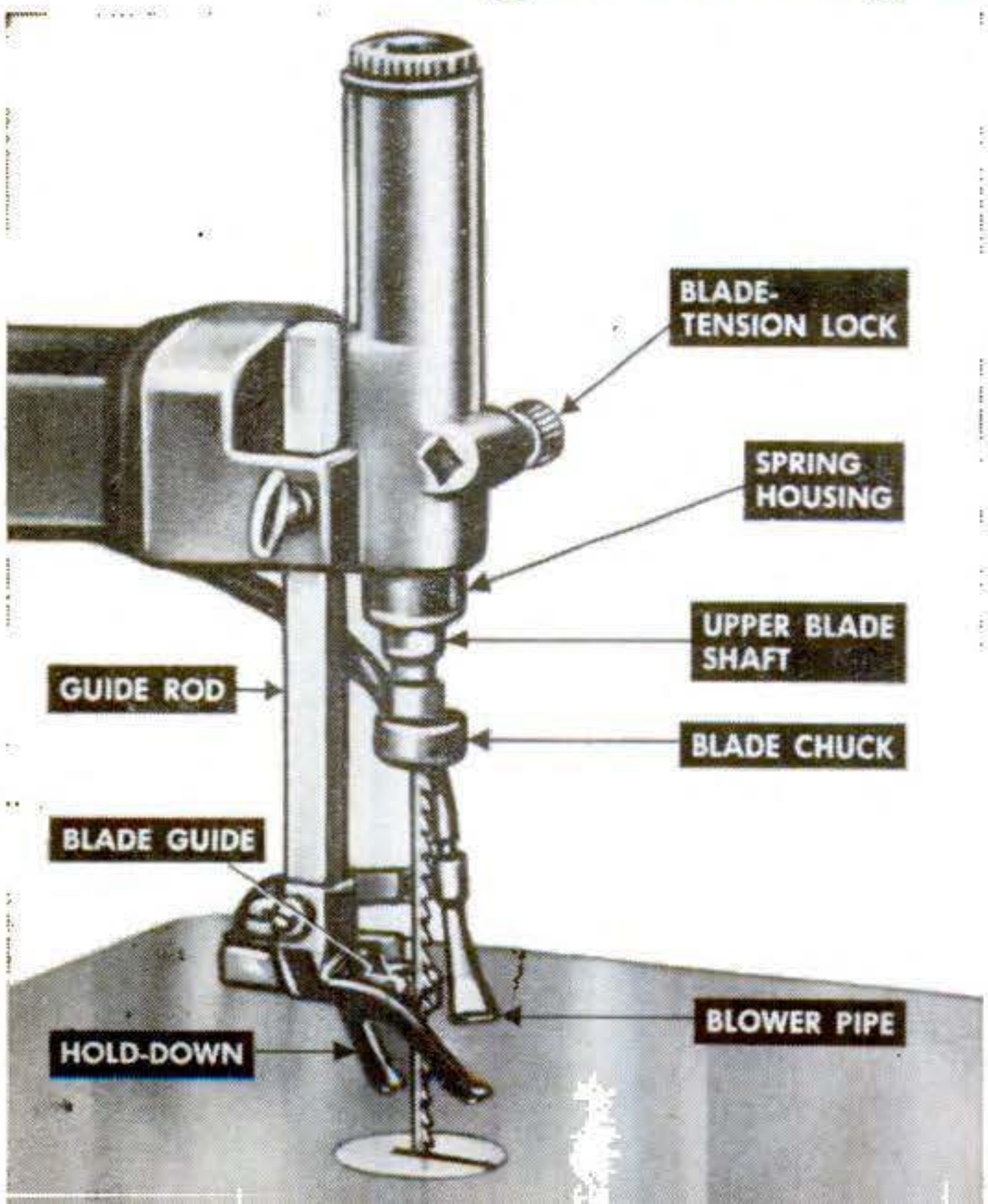
If the machine is set up to run, turn it on and listen. Excessive noise suggests that the bearing housings are worn, in which case the machine is of little value.

Put it through its paces as far as possible —drilling holes, of course, and using what accessories are at hand. In listening for noise, don't be perturbed by pulley whine at high speeds. That's normal. Rattles and roars, symptoms of worn or damaged parts, are what to listen for.

7. To check if table top is square with spindle, bend a piece of wire and put it in the chuck so that it almost touches the table several inches from the center. Rotate the spindle by hand to be sure that the wire will just graze the table at all points in the circle.

If the table proves out of square, there are two possibilities: it may have to be reground at considerable cost; or the surfaces at the table swivel may be out of line so little that it can be satisfactorily corrected by a little filing.

Jigsaw: Is it big enough for your work?

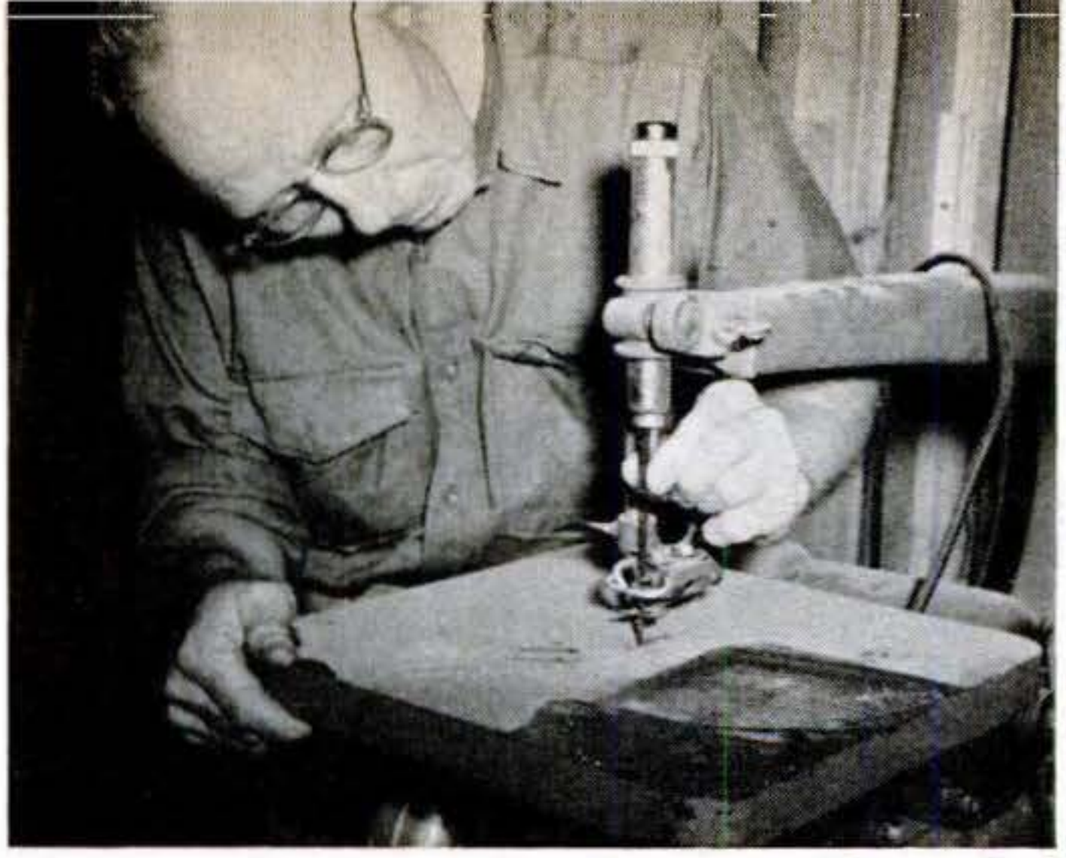


SUITABILITY here is a matter of size, quality, condition—and especially how you expect to use it. If you don't have a bandsaw and don't expect to get one, you may need a pretty heavy jigsaw, one that will do some work that properly calls for a bandsaw.

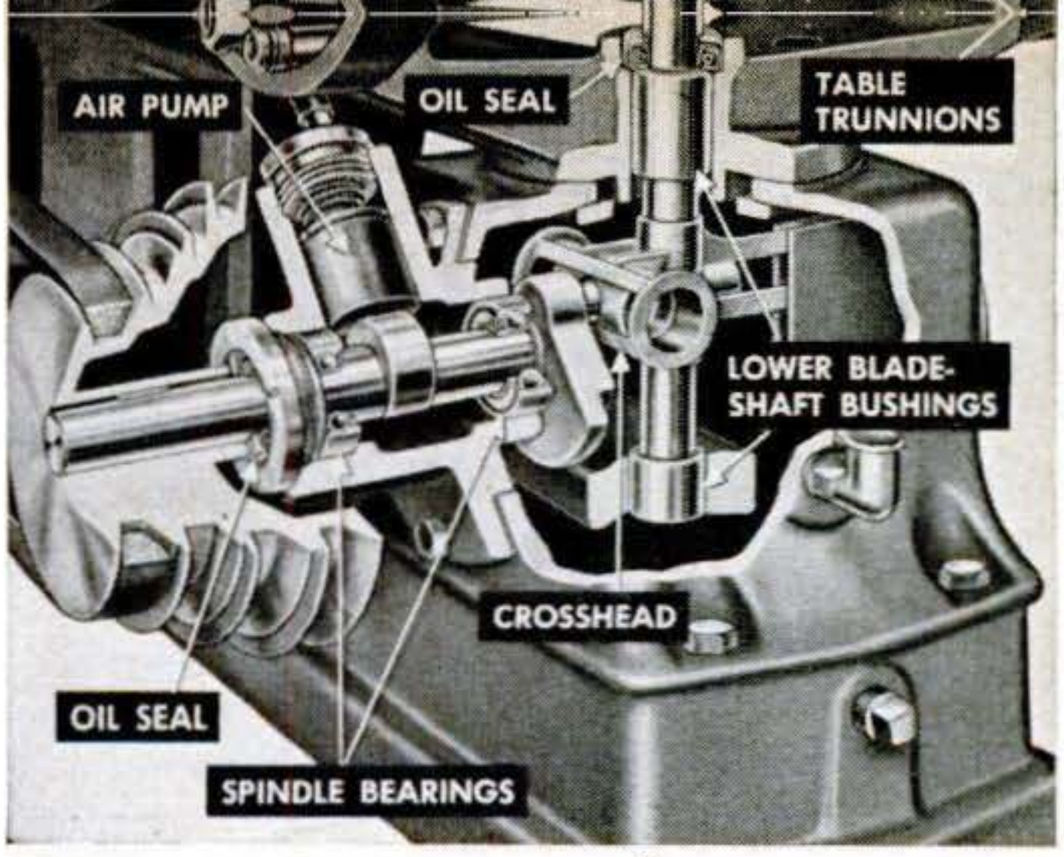
1. Try to move both upper and lower operating shafts from side to side. If there is play, try to find out whether the shafts travel in bushings or directly in castings. This is important because worn bushings are fairly easy to replace while worn castings are likely to cost you more than the machine is actually worth.

2. Check the driveshaft in the same way. Lateral play indicates worn bearings or castings.

Copyrighted material



Key test of a secondhand jigsaw: If you find lateral play when you try to wiggle the upper blade shaft, better add the price of new bushings or castings to the cost of the machine.



Hidden mechanism is equally important. Tests and checks explained in the text will help you determine the condition of rotating and reciprocating parts shown here.

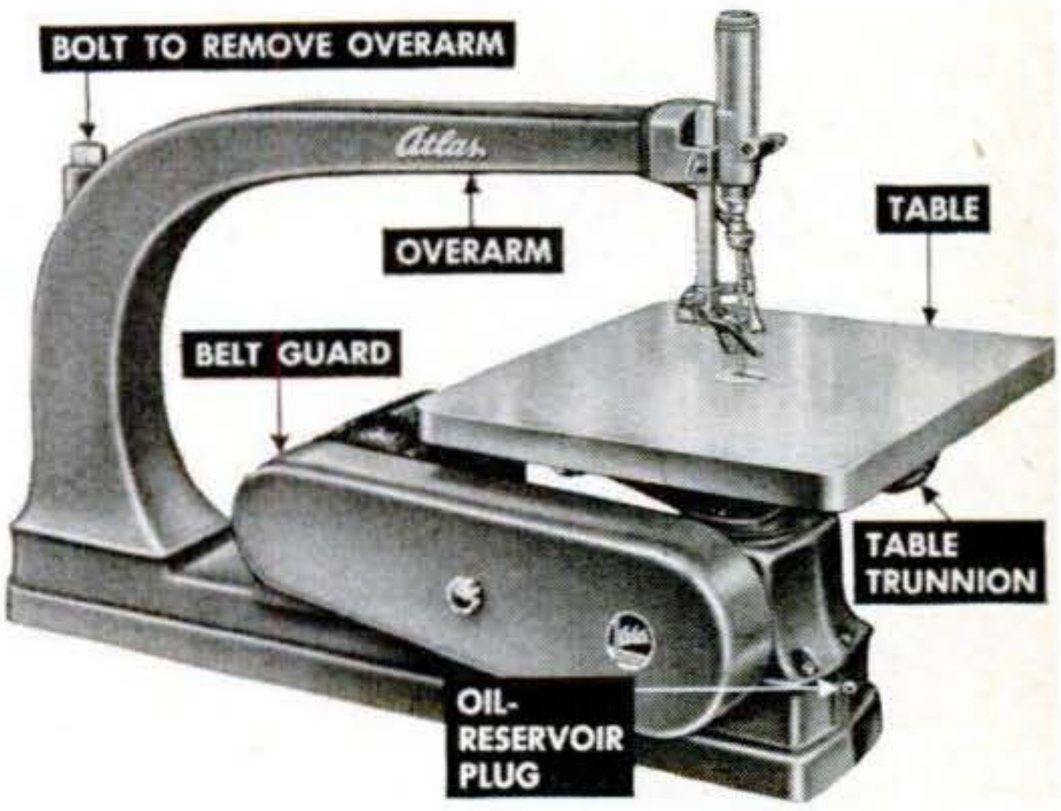
3. If you can, start the machine and listen. Noisy running indicates presence of worn parts.

4. Wear in the driving mechanism can be detected by holding the lower chuck with one hand and rocking the drive pulley with the other. Any wobble of the chuck shafts when extended indicates bearing wear.

5. Examine chucks to see if all parts are there and undamaged.

6. Inspect blade guides for wear. These can probably be replaced at moderate cost if the maker is still in business.

7. Check vertical alignment of the blade. Unless the overarm is adjustable, anything wrong here may indicate a damaged frame.



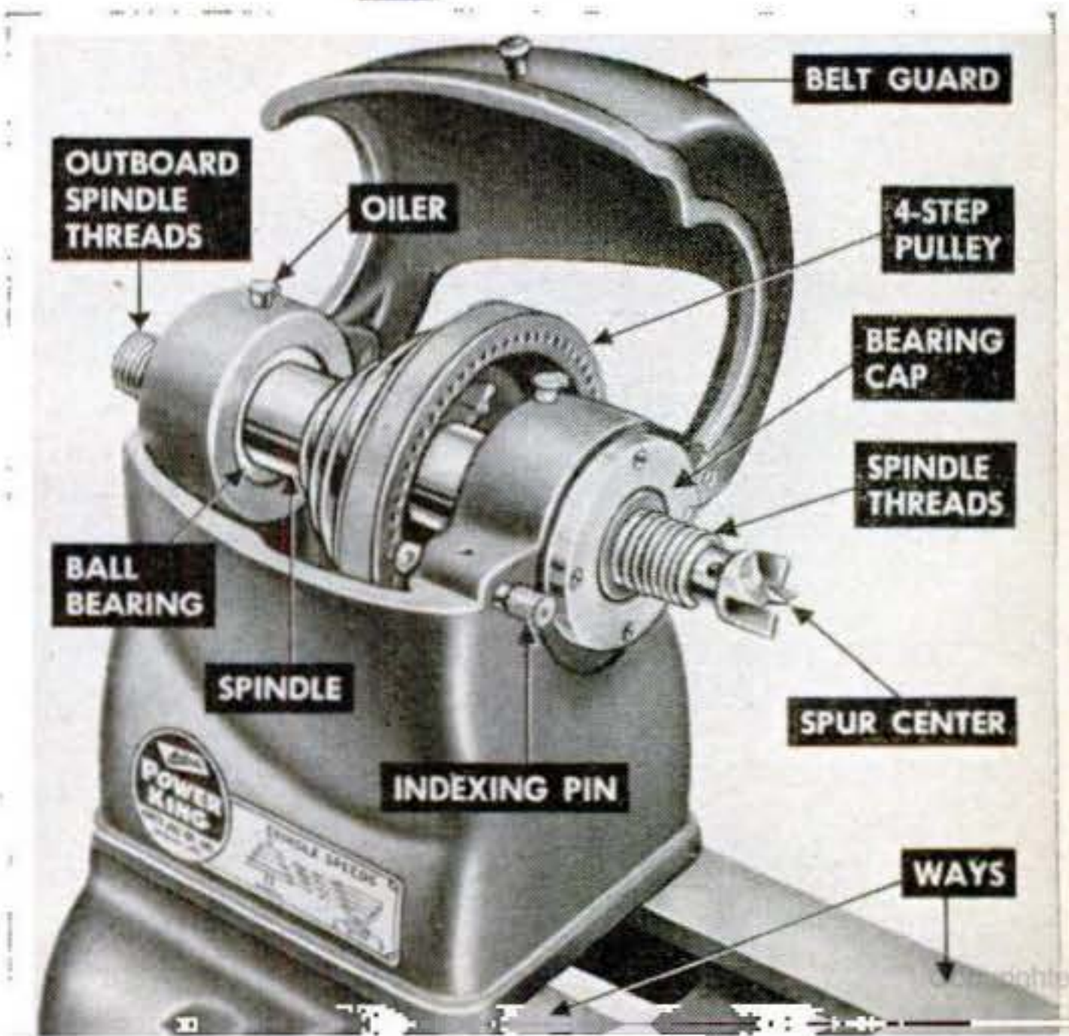
Principal parts of typical jigsaw are shown as you see them from outside. Check carefully.

Wood lathe: Are any accessories included?

Main lathe points are shown at right, but save closest inspection for inside headstock, shown in photo below. Check spindle for lateral play and make sure spindle threads are good.

BEGIN by asking yourself whether the lathe was built to do the kind of work you need it for. If it has an 8″ swing and you need a 12″, it is hardly a bargain for you at any price.

Same goes for distance between centers. The 24″ size may do nicely—but not if you want to turn table legs. And if you contemplate making some kinds of floor lamps, even 30″ between centers may not be enough. In that case, find out whether a bed extension can be bought. *(Continued on next page)*



1. Inspect the internal tapers in the headstock spindle and tailstock sleeve. If they are only slightly nicked they may be corrected; if they are badly banged up, they may call for $10 worth of replacement.

2. You can easily check the alignment of spindle and tailstock center by sliding up the tailstock until the centers almost touch. If they are out of line, see if adjustments will line them up. Also make sure that the sleeve in the tailstock can be clamped in this position firmly and without wobble.

3. Look closely at the threads on both ends of the spindle. If these are worn or damaged, add replacement cost to the asking price of the lathe. Current price for a new head spindle for a 12″ wood lathe is around $10.

4. Check the spindle for lateral play by trying to move it back and forth. If bearings or bearing housings are badly worn, you won't be able to do good work.

5. If you think you may want to use attachments for turning metals or plastics, make sure that the lathe bed hasn't been nicked or gouged.

6. Are any accessories included? Various chucks and arbors are worth having and may cost up to $10 or so. Wood-turning chisels usually cost close to $2 apiece, carbide-tipped ones run just about twice that much.

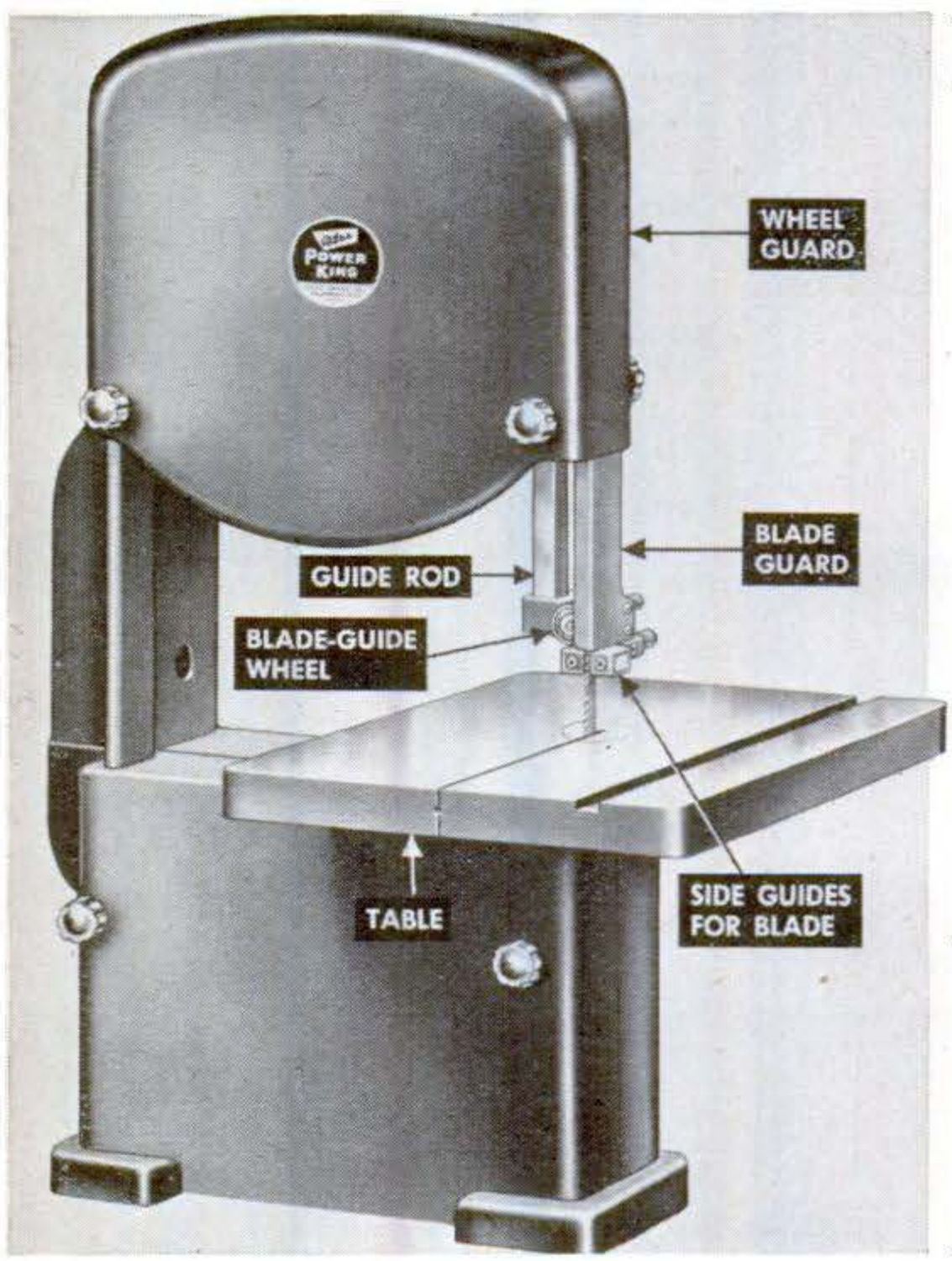
Bandsaw: Be sure it uses standard blades

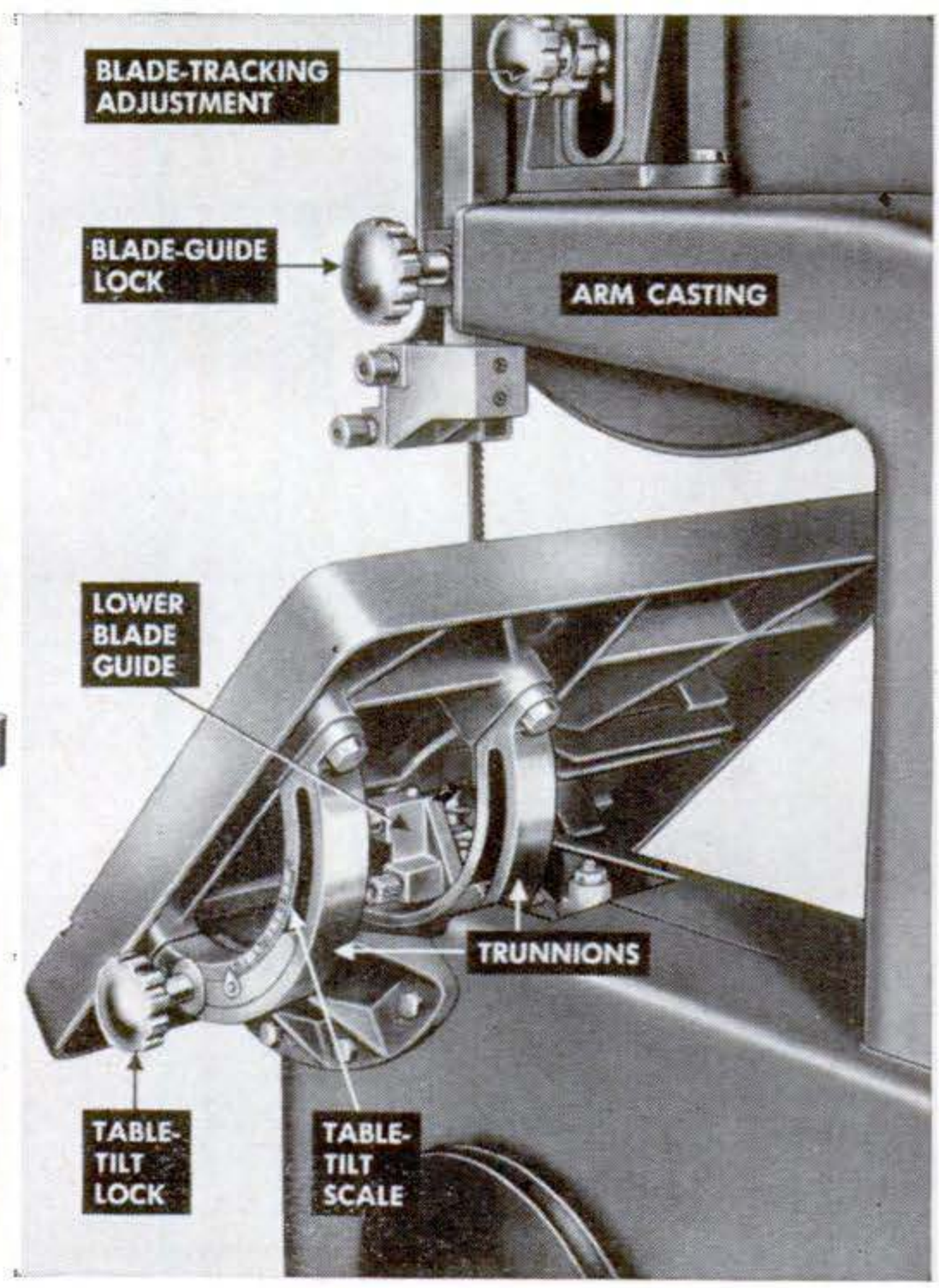
SIZE is measured in depth of throat, 12″ from blade to throat being typical. If you want to work thick stock or do resawing, you'll want to know the cut capacity—4″, 6″ or, on the bigger floor models, 12″ or even more.

1. Try to wiggle the upper and lower wheels. If you can do this, the bearings are worn and it may become impossible to keep the blade on.

2. For insight into the condition of the machine in general, by all means check the rubber tires on the wheels. Wear suggests that the saw has had extremely hard usage or that one wheel does not track with the other—indicating a defective or damaged frame. (Replacing worn tires doesn't amount to much in itself—they cost about 75 cents apiece.)

3. Blade guides are generally replaceable for a few dollars. But if block guides are badly worn or the ball-bearing guides won't





Make a general check of the parts shown at left above. Tilt the table and use a flashlight if necessary to inspect condition of table trunnions and lower blade guide, as shown at the right.

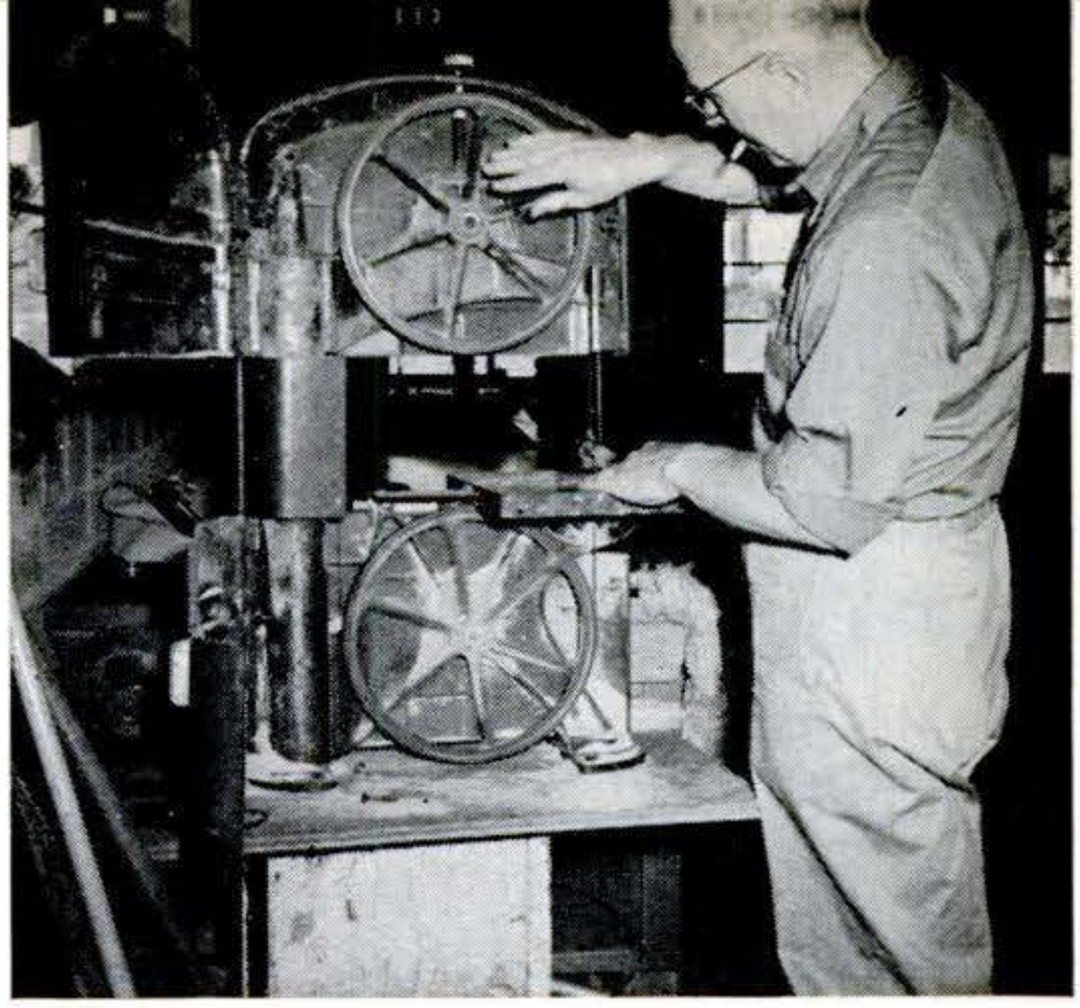
Copyrighted material

turn, be mighty sure that you'll be able to get replacements for them before you shell out.

4. There's another point where it is all too easy to get your fingers burned. Even if the machine is in fine condition and reasonably priced, it may not be an economical buy if it uses a non-standard blade. Having to have special blades made up all the time is inconvenient and adds substantially to operating cost.

5. Are the wheels in balance? To check this, take off the wheel guards and blade and spin each wheel several times. If the same part of the wheel ends up at the bottom on several spins, the wheel is probably out of balance. This may make the machine vibrate so much that it would spoil the accuracy of your work—to say nothing of taking most of the pleasure out of it.

6. If you can turn on the saw, let it run a bit, listening for uneven sounds. Watch to see if the blade can be adjusted to run near the center of both wheels, and that it doesn't hit the guards anywhere.



Open the bandsaw and take a look at the wheels and their tires. Try to wiggle the wheels. If you can do so, bearings are worn and it may be difficult to keep the blade on them.

Multiple tool: Is it easy to change from one tool to another?

If you are eagle-eyeing a secondhand Shopsmith, or one of the new flexible-use radial saws, or any other multi-purpose tool, you'll want to make many of the checks already mentioned, plus a few special ones.

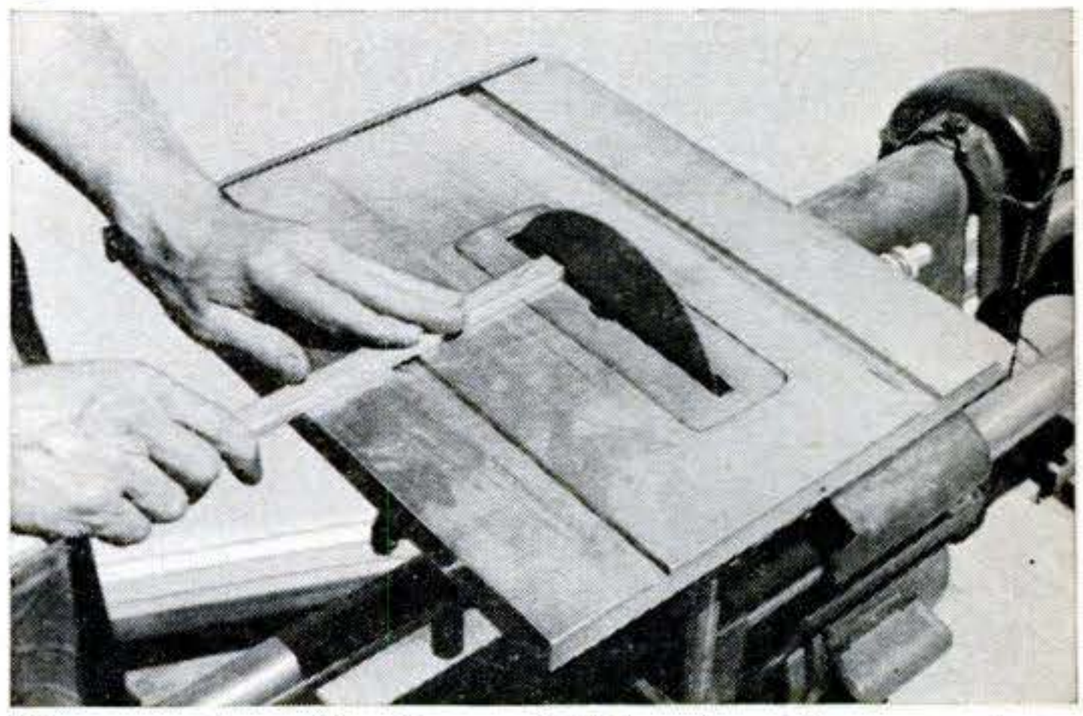
1. Even if it is not set up to run, you can put it through its changes to see how easily it converts from one tool to another. Watch for damage to bars or rods that might prevent an easy shift.

2. Look for external signs of neglect—cracks, mars and rust.

3. Most important is the condition of bearings and power-transmitting assemblies. About the only sure way to check these is to run the machine under power. Your ear will tell you more about the condition of the machine in 30 seconds than your eye could in an hour.

4. Put a saw blade or sanding disk on the spindle to find out if it runs true. You can check this by holding a piece of wood against the disk or blade as it revolves. If it does not maintain even contact, the blade or disk is out of alignment—or the spindle is. Switch to another blade or disk. If the misalignment still shows up, you can figure that the trouble is in the spindle—a fairly costly replacement on most tools, to be figured as part of the cost if you buy.

5. Check suitability of the combination tool much as you would with single-purpose tools. Is the depth of cut adequate for your sawing operations? As a drill press, is there enough distance from column to chuck? Is the spindle travel as long as you'll need for your purposes?



Heart of multiple tool like this Shopsmith is the spindle. Hold a stick against saw or sanding disk as it runs. Stick won't maintain contact all around if spindle doesn't run true.

Any power tool should be thought of as a long-time investment that will bring pleasure and often considerable profit to its owner. It will, that is, if it is a well made tool in good running order.

Hard-headed checking of your prospective purchase against these standards is one way to be pretty sure you are getting your money's worth. An inaccurate, balky or worn-out tool is no bargain, no matter what price you pay for it. END

Next month: How to judge a used circular saw, jointer, sander, shaper and electric motor.

Copyrighted material

Shutters Make the Difference

Painted a harmonizing color, they add that finished touch to any house. Here are four useful styles.

EVER notice how many new homes have a bare, unfinished look? Lots of them are that way because they lack one thing—shutters. Good blinds are easy to build with hand tools.

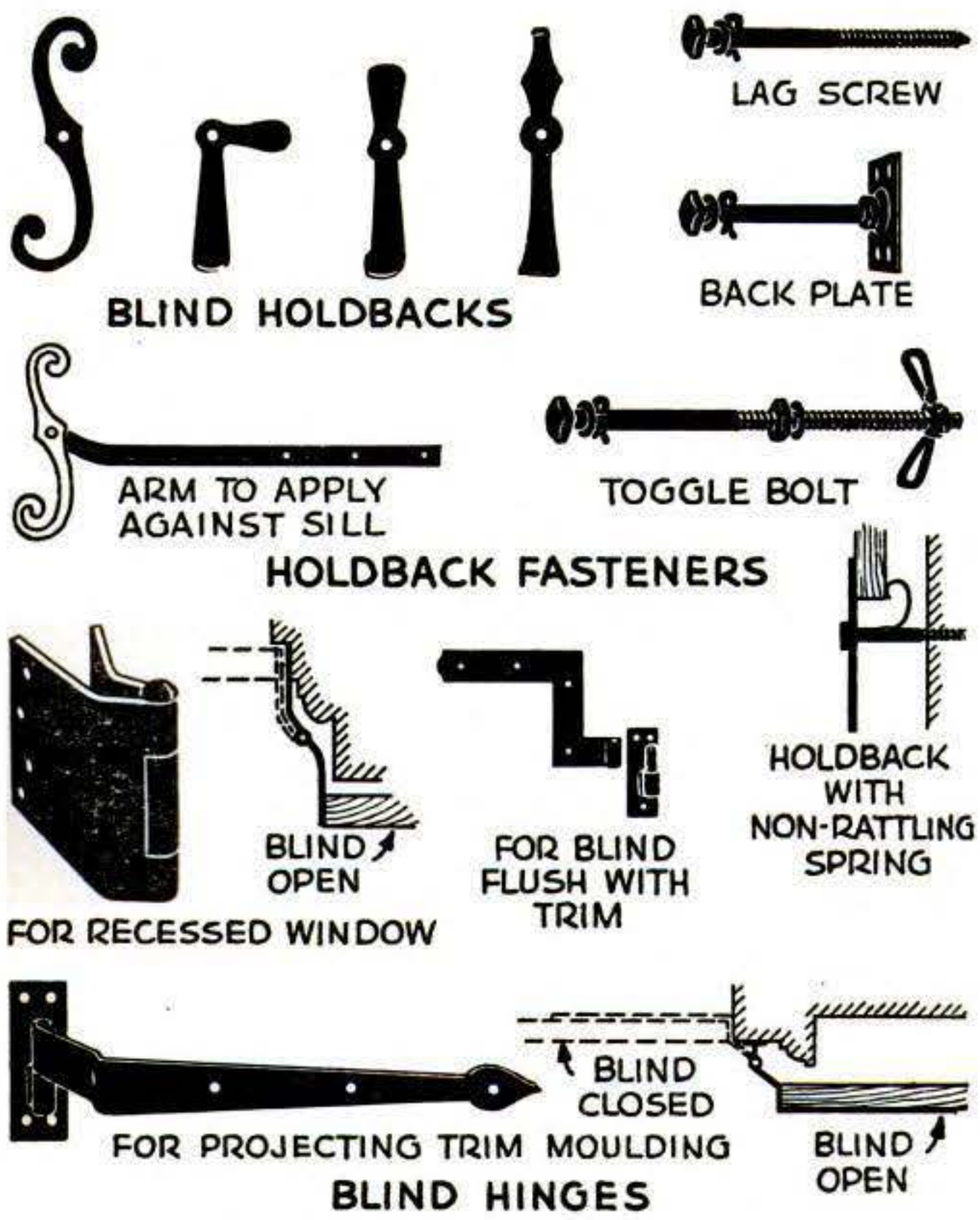
1. Shutter lines should follow the lines of the house. These blinds, of tongue-and-groove braced with one-by-twos, follow the horizontal lines of the house.

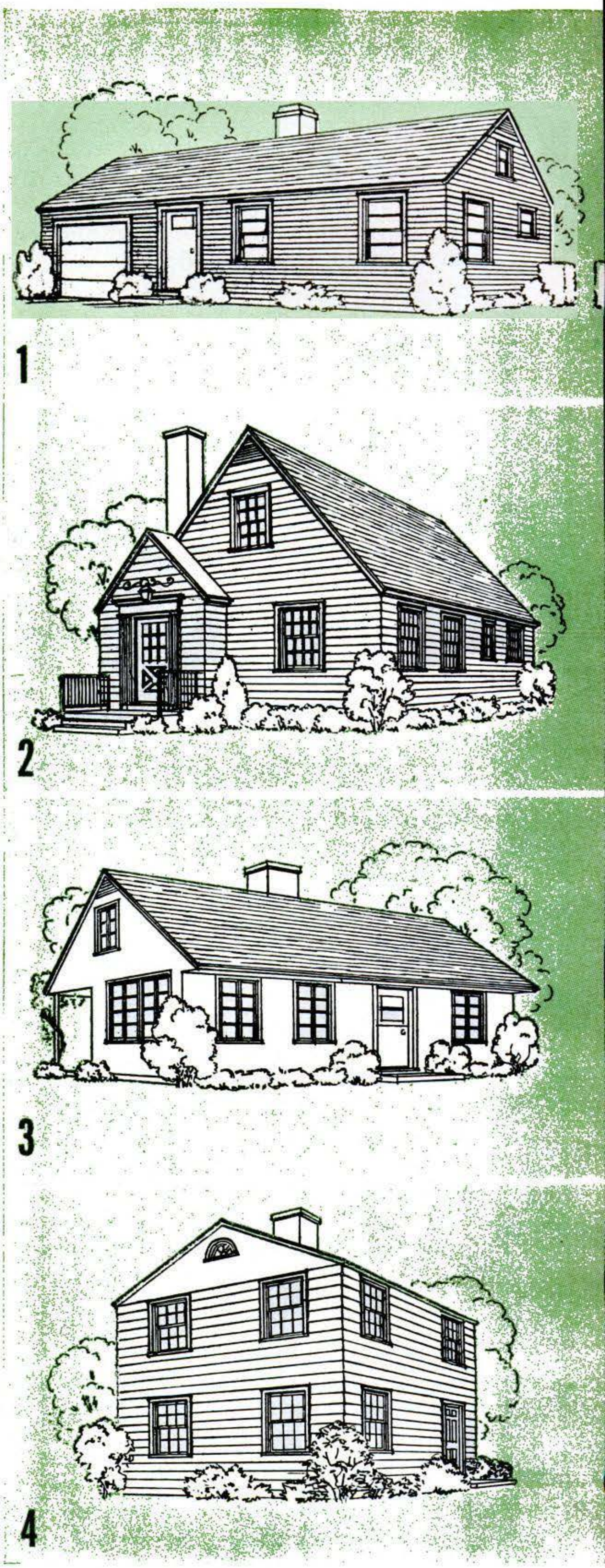
2. When there are no dominant lines, shutters made with angled boards look well. These are braced with 1″ strap iron.

3. Shutters made of drop siding match the horizontal lines of the sash bars.

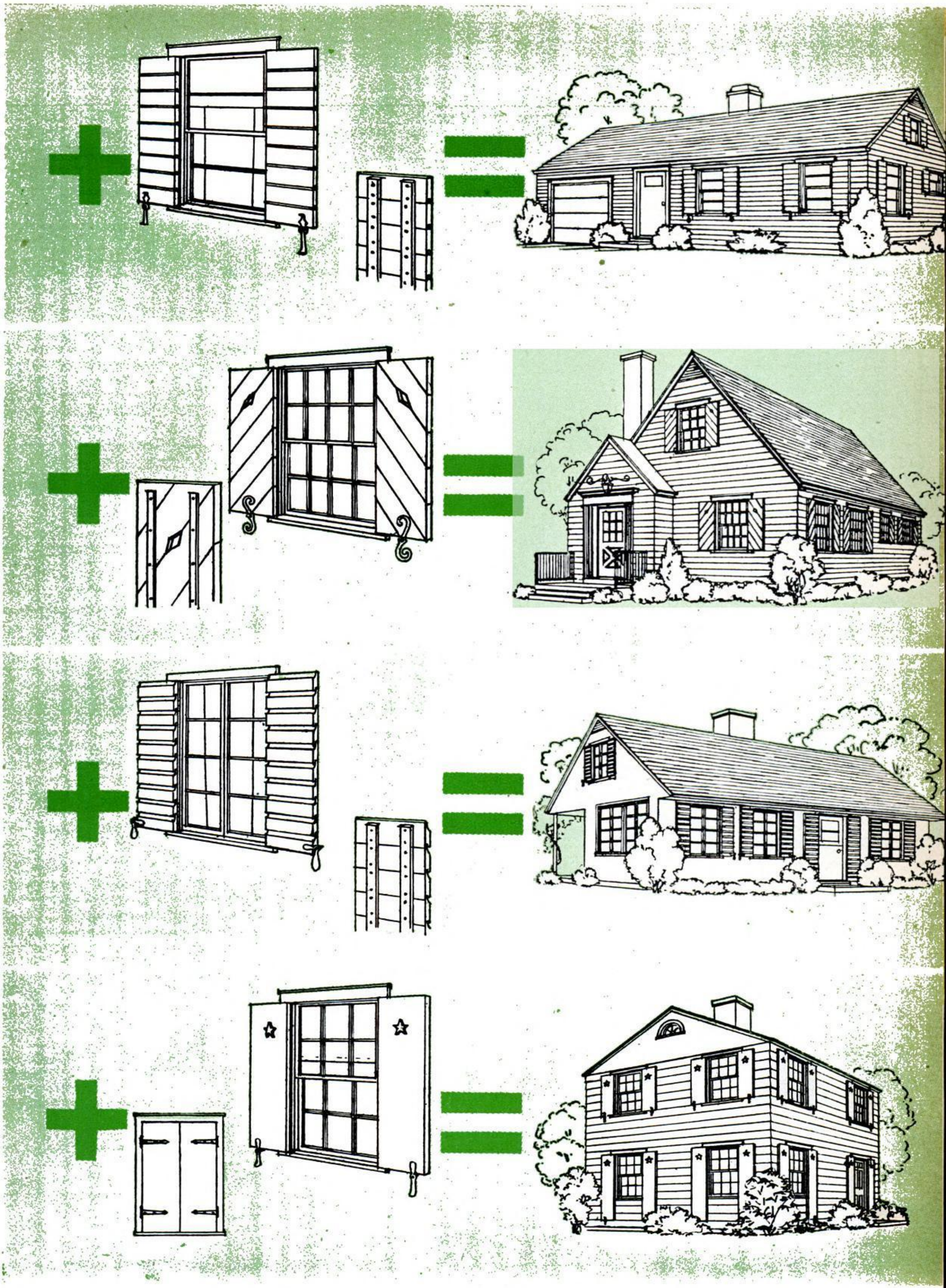
4. These are ¾″ exterior-grade plywood with ¼″-plywood stars as decorations.

Below are some types of shutter holdbacks and hinges that are available.—*Carl T. Sigman and William J. Ward, Jr.*



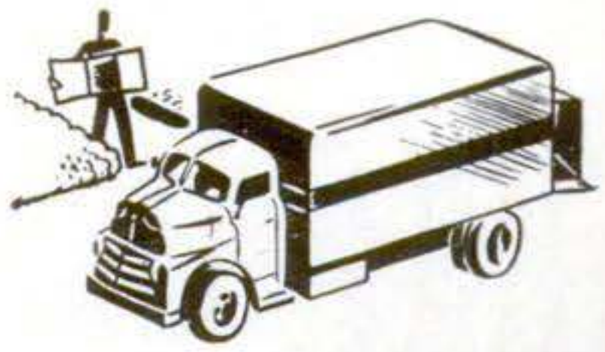


Copyrighted material



Copyrighted material

Experts

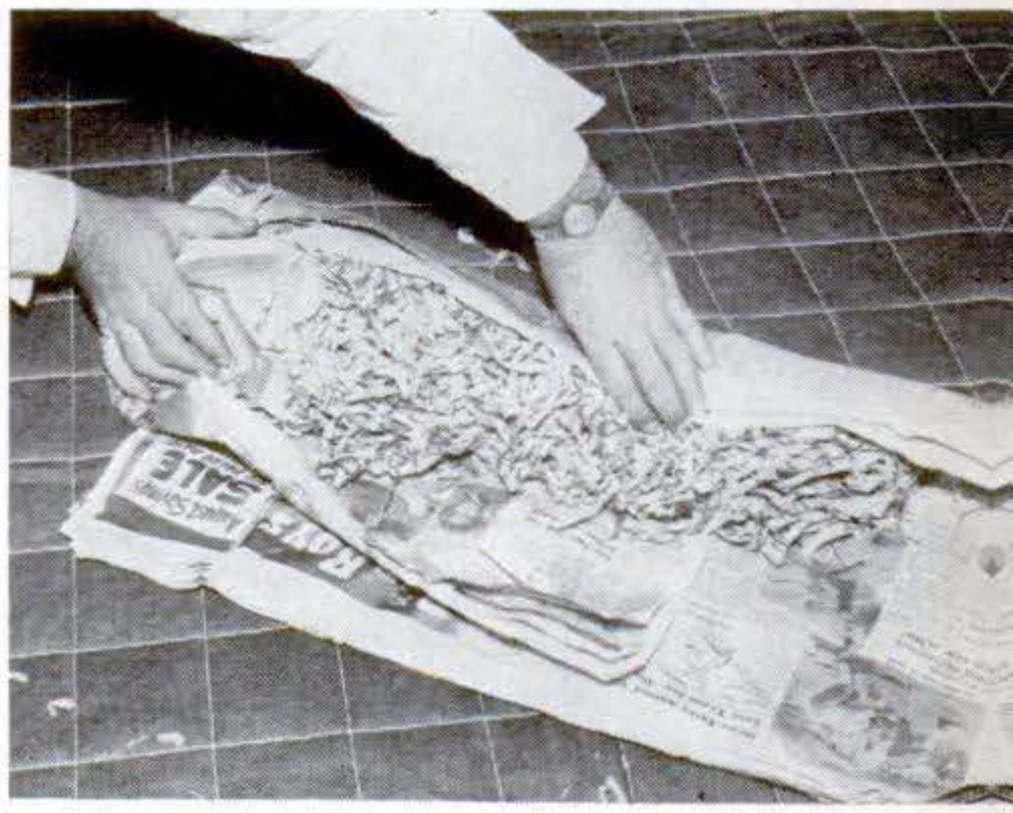


Three things good movers do on long-distance hauls. Glassware is individually wrapped and packed in a barrel (left). Lampshade, covered with tissue, goes into carton. Oil painting is measured for a shipping crate.

How to Pack Fragile Items

Cover a table with a blanket or quilt (left). Have shredded paper or excelsior and a pile of newspapers on hand. Spread 2″ layer of shredding on paper (center) and put the first bowl or dish on it. Nest others with 2″ of shredding between, letting it spill over the sides of each to protect the edges. Pack at most four bowls, or six plates or saucers, to a bundle. Pick up two sheets of paper and fold tightly, one corner over the other (right). No string is needed.

To pack china lamp, distribute shredding evenly on doubled sheet twice as long as object. Bed the lamp in this, pulling the stuff completely around it. Roll lengthwise into a tight bundle, tucking the ends of the sheet in. No string is needed. You can pack up to four lamps to a barrel. Fill the spaces between with wrapped cups and saucers to prevent shifting.



Copyrighted material

Show You How to Move

Here's how to handle everything from stemware to gas stoves without knocking yourself out. You can use these professional techniques even if you're just moving down the street, or switching furniture around.

WHEN it's your move, it's nice to call in some husky professionals with a van and go fishing until the chore is over.

But if your new home is just a few doors down the street, or you have some spare time and no grand pianos to worry about, you may be able to do your own moving. A station wagon or a rented truck, plus a day's work for you and a helper, should see the job done, with a saving in your pocket.

It'll take sweat, but you can save yourself blood and tears if you know how. This assumes, of course, that you're as husky as the average and in fair physical trim. Otherwise, you certainly shouldn't tackle it.

However, moving takes more than muscle. It calls for teamwork in handling two-man loads, know-how in packing fragile items and skill in loading the truck. Here's the low-down from 500 experts—the drivers and handlers of Bekins Van and Storage Co., an organization with 51 branches in 10 western states.

Skip the piano. Bekins men say you'll be smart to leave pianos to the professionals. Not even four husky amateurs can get a standard upright down a flight of stairs without risking broken limbs or worse. It takes a well trained team.

But the thousand and one lighter objects in a household really comprise most of the chore. If you don't mind hard work, you can move them.

What you'll need. Full-time movers

Pack barrel in layers, with 2" of shredding on the bottom and between layers. Put in heavy china first, then light pieces, with glassware near the top. Wrap each glass piece separately in shredding and newspaper. Always stand glassware on end. Pack excelsior or shredding between bundles. Wrap jars of preserves individually in paper, shredding, and again in paper. Pack upright in a barrel, but fill barrel only half with preserve jars. Pack the rest with light items.

Wrap small mirrors and pictures in pairs (below). Lay first one diagonally in center of pad or blanket, face up. Fold pad over and place second mirror over folded part, face down. Then fold the two side corners, tucking them under the top mirror. Fold fourth corner to complete the wrap. Load high in truck, flat if you have a smooth, firm support, or on edge.

When you move . . .

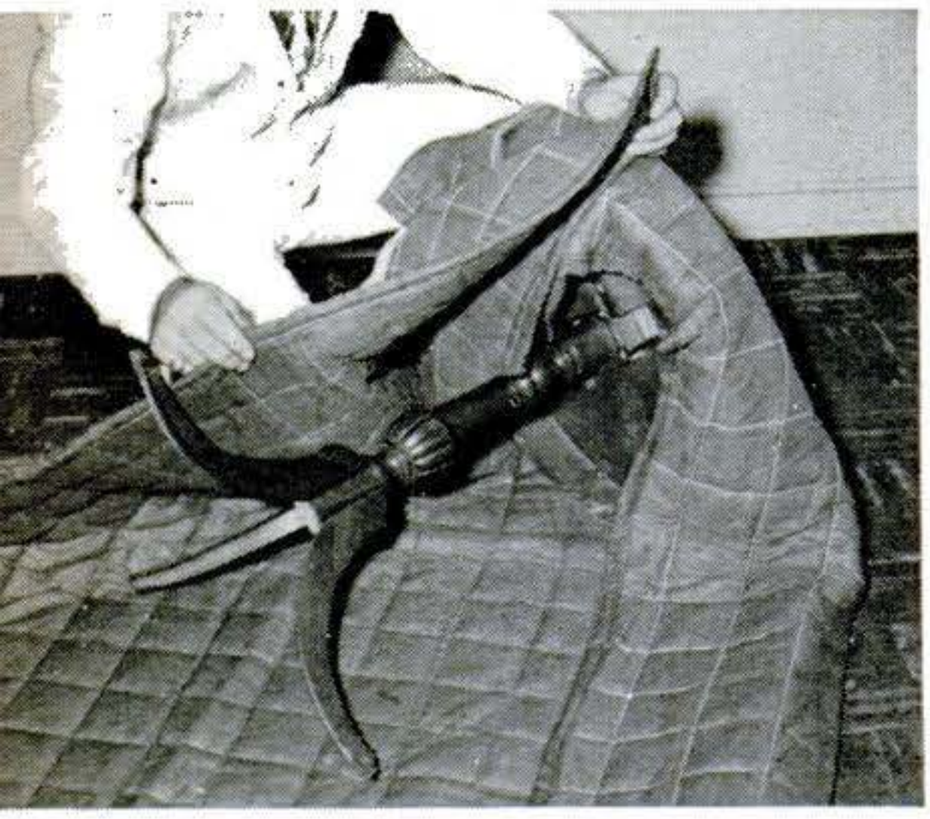
Pack plates and saucers on edge.
Pack stemware upside down.
Secure record-player arm.
Wrap sharp garden tools.
Bolt down refrigerator unit.
Drain garden hose.
Remove handles from bicycle, lawn mower.
Line boxes for books with paper.

Never, never, never . . .

Fold innerspring mattresses.
Tip TV sets while loading or carrying.
Fold rugs; instead, roll them.
Pack more than six plates together.
Pack inflammable liquids or oil mops.
Slide packing boxes on the floor.
Stand on bare furniture when loading.
Load fragile items on the bottom.

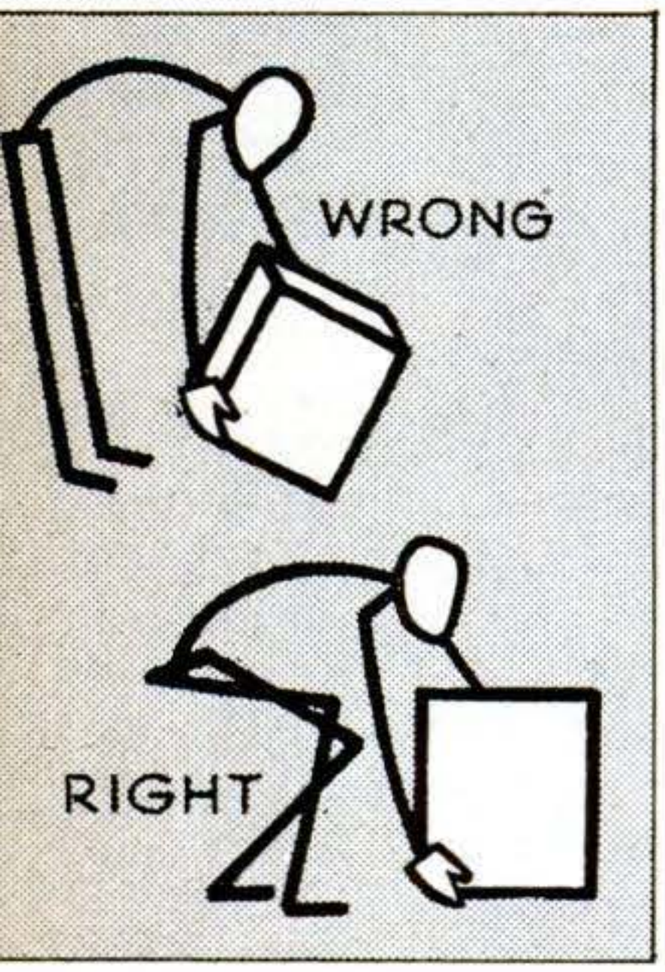
Copyrighted material

Wrap Light Furniture Before Loading

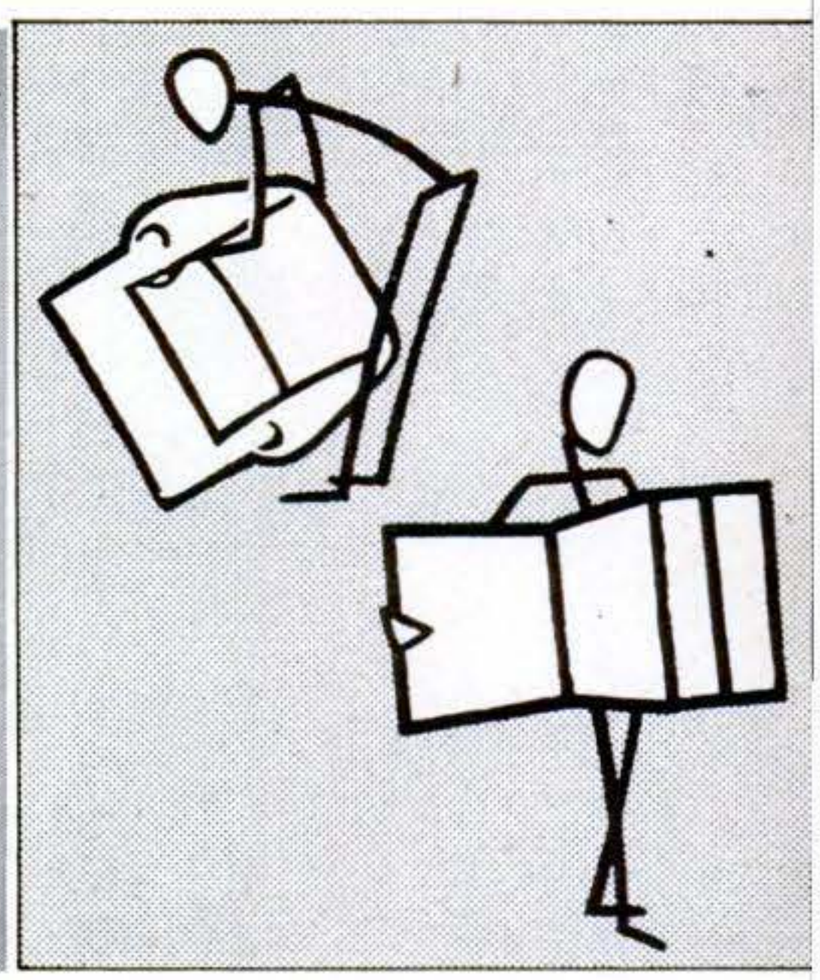


Fragile tables, light chairs and similar delicate pieces should be wrapped like this. Place the piece diagonally on a quilt. Fold nearest corner over the top, then the side corners, as at left. Wrap fourth corner over legs. Bundle is easy to carry (right). Remember to stow it high on load to avoid crushing.

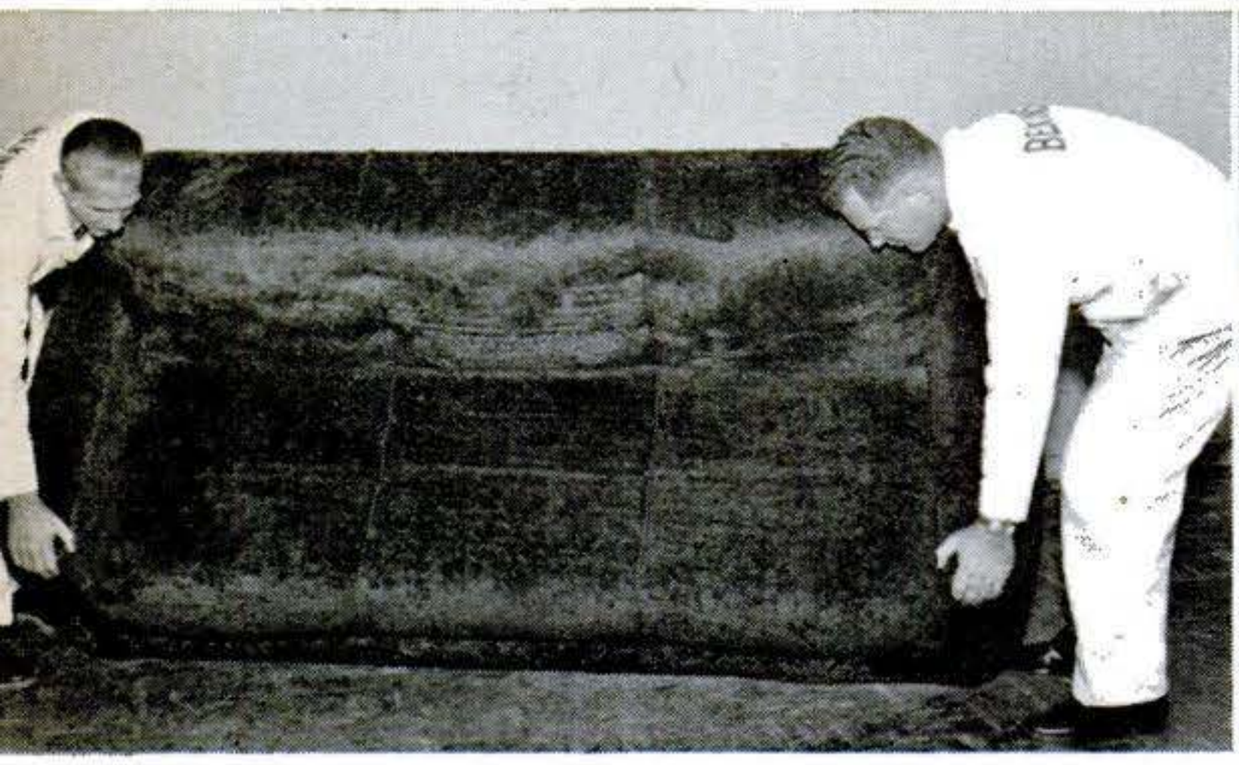
Here's the Way to Rassle the Big Stuff

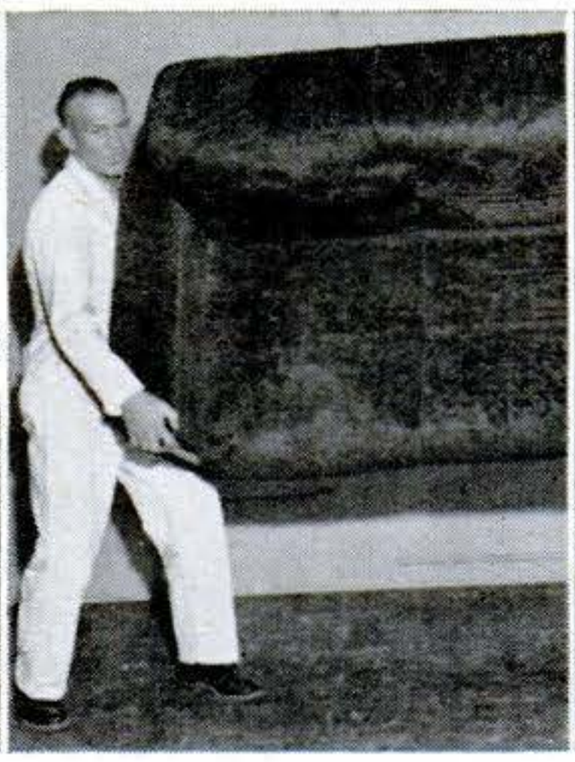


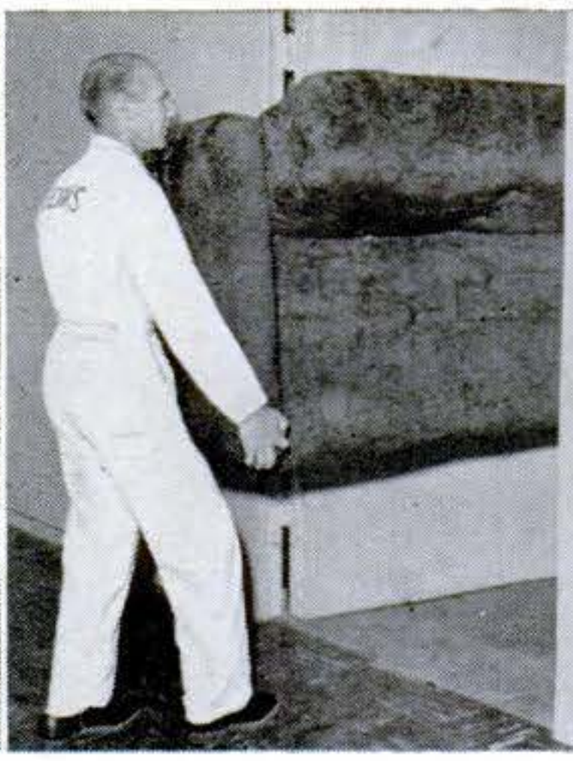
Let big leg muscles, not back, do work of lifting heavy pieces. Bend knees, straighten up to lift load.



To carry overstuffed chair, stand on one side, place one hand against inside corner of far arm, and grasp outside of arm with other hand. Bend knees, pivot nearer arm against them, and swing chair onto your shoulders. To hook chair around narrow doorway, carry it as at right. Use two-man davenport carry for extra-big chairs.







Davenport is a two-man job. Each man grasps bottom near rear leg, and front of one arm. Piece is tipped forward first as at left, unless it has fragile legs. In this case it must be lifted and tipped simultaneously. Then it's held on the thighs (center photo) while rear hands are shifted down to what are now the bottom rear corners (actually front legs). You can get such a piece through a door 12" narrower than it is, by hooking it around the casing, one arm at a time, turning it as necessary to take advantage of the best angle.

Copyrighted material

like Bekins teams carry about $1,000 worth of equipment, such as tools, dollies, straps, and pads for a whole vanload at once.

Since you won't have all this equipment, you'll have to handle fewer pieces at a time. With a station wagon or pickup truck for hauling, you'll probably have to make your move in installments anyway. But there are some things you should have on hand.

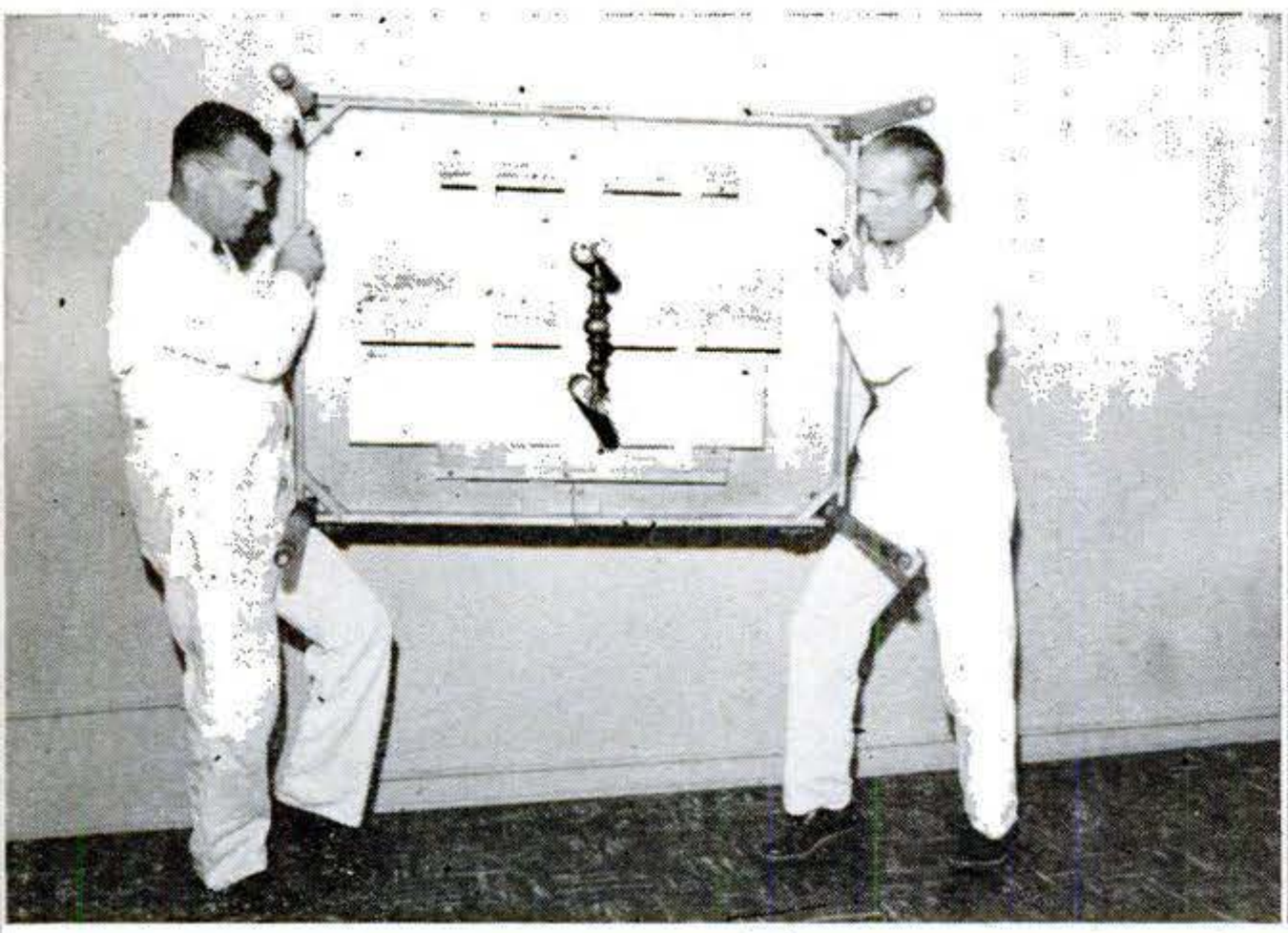
First among these is lots of excelsior or shredded newspaper, which you should be able to buy at a local warehouse. Don't skimp on this—it may save a treasure.

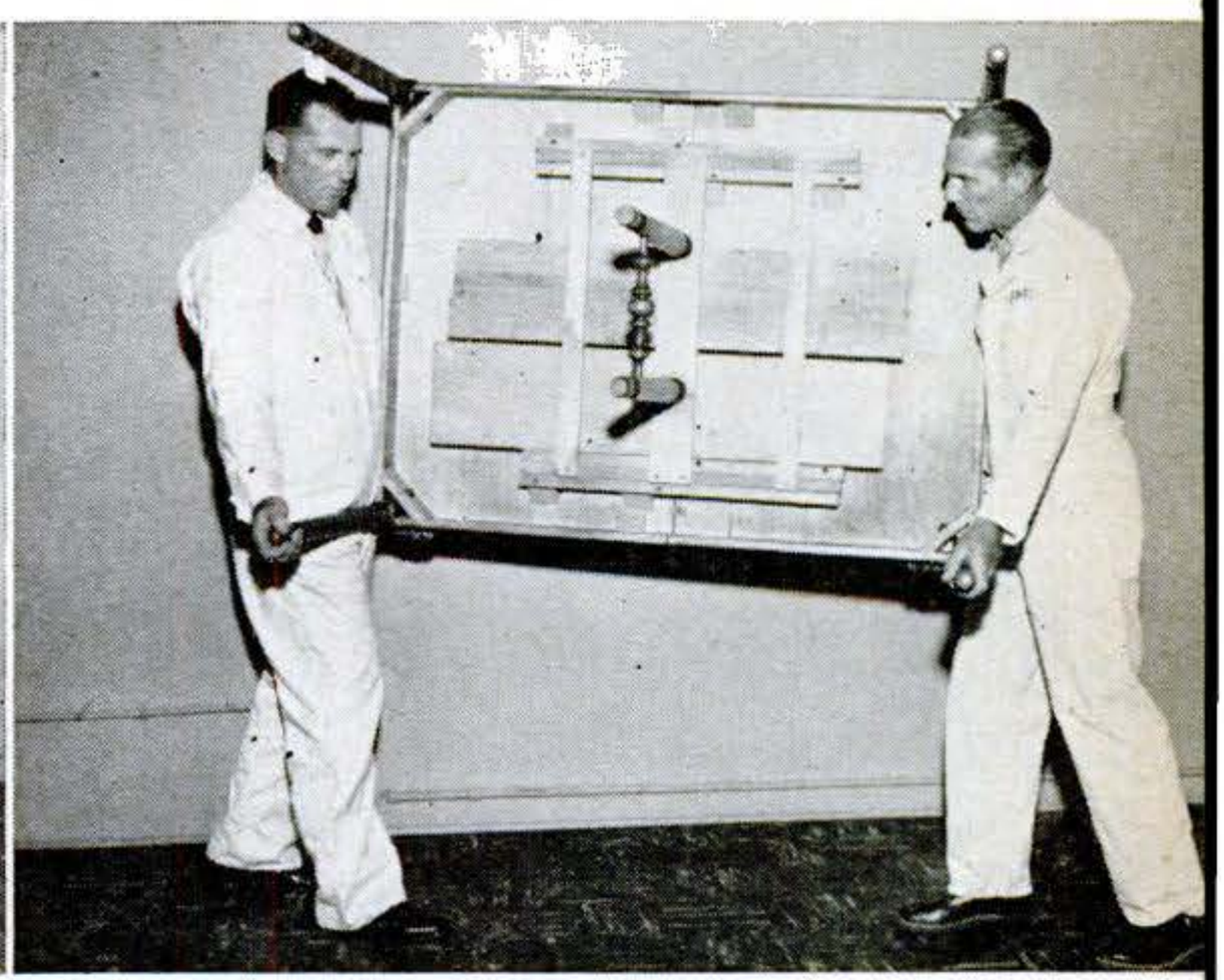
Collect all your blankets and quilts, and if possible borrow more. You may be able to rent some moving pads from a warehouse.

Two handy helps are "shoulder skins" and straps. The skin the experts use is a 7′ by 8′ piece of mattress ticking, folded diaper-fashion and placed around the shoulders. The ends are wrapped around the hands to protect them against sharp edges, while the center part enables you to get your shoulders under part of the load.

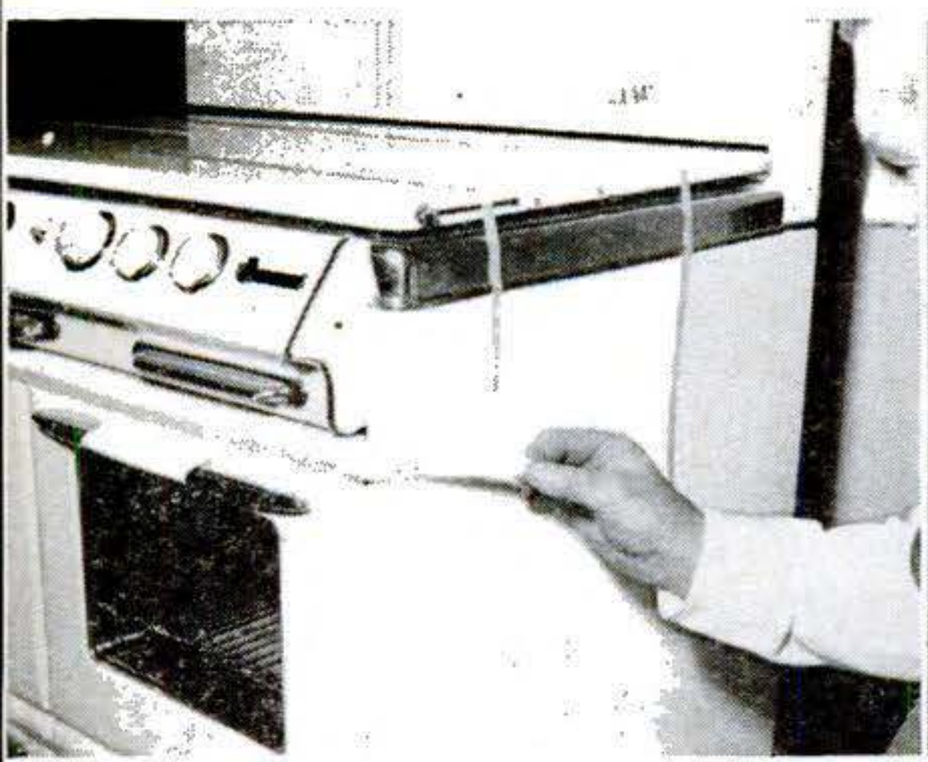
Straps may be lengths of belting or webbing 2″ wide. They are used much like shoulder skins, the ends being wrapped around the hands.

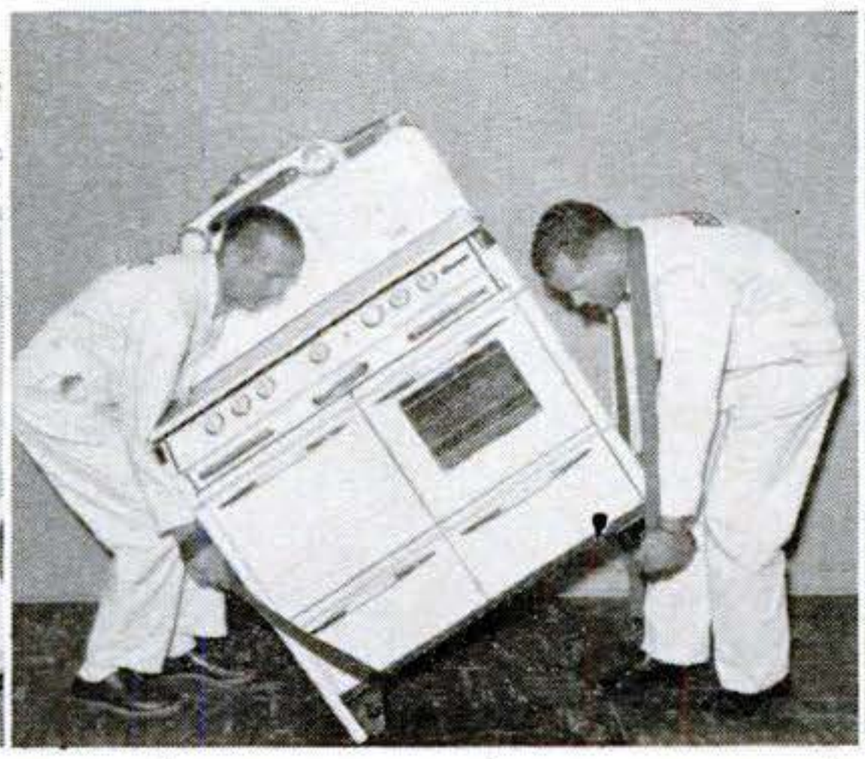
Save your back. Moving is hard work. Don't make it harder by starting with a

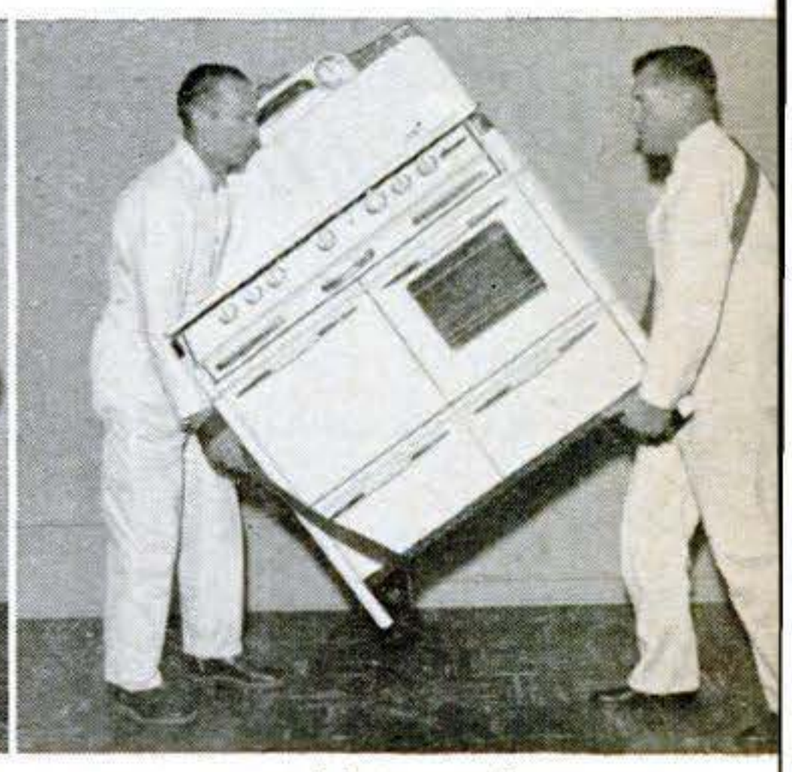




Turn tables on edge if they are to go through doors. With a helper, put one hand on the rear edge, the other under the adjacent edge nearest you. Lift and turn the table in one movement to position at left above. Rest it on the thighs while shifting the upper hands down to grasp lower legs near the ends. If doorways are a tight squeeze, drape a pad over the top to protect its finish. To negotiate awkward turns, better take off the legs.

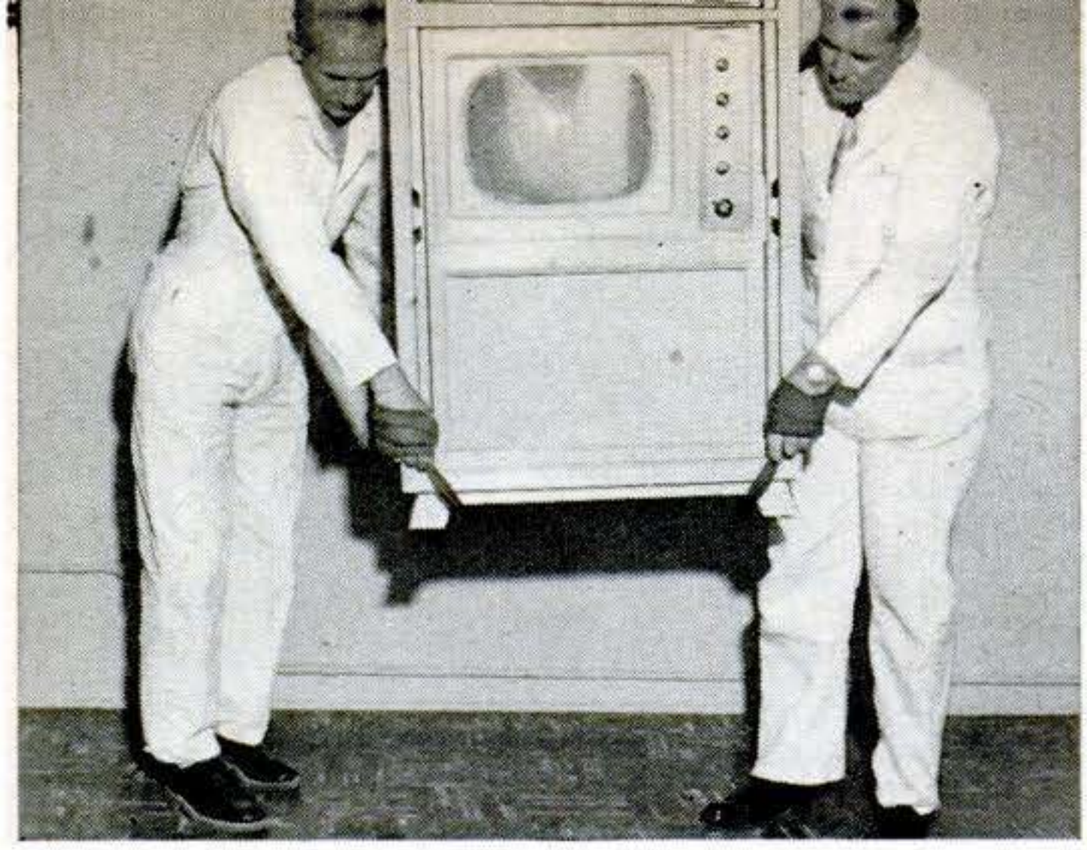






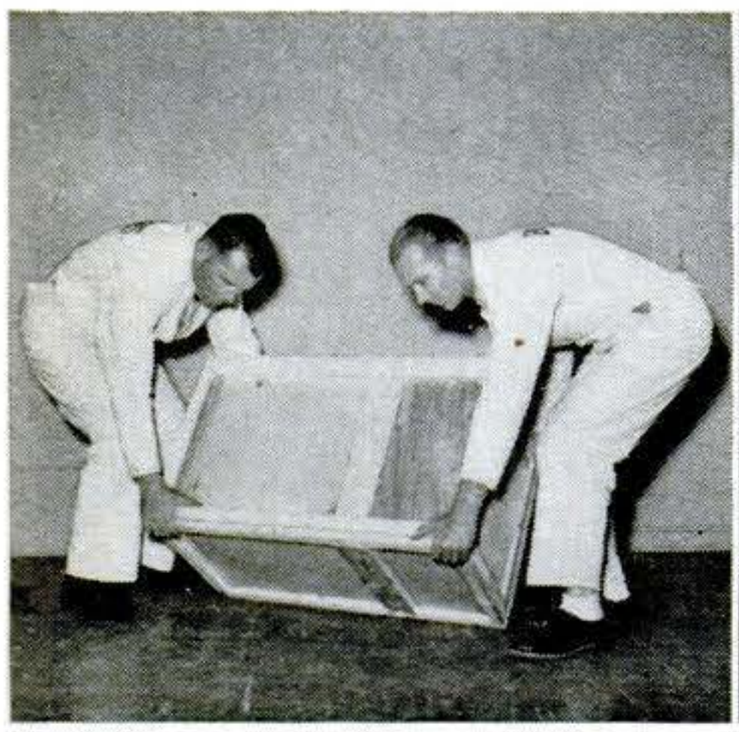
Ranges must be buttoned up with tape or string to hold doors and lids shut. Be sure the oven is empty, especially if the door is glass. Remove the grates and burners and carry them in a wooden box. Straps help shoulder the load, and protect hands. The man on the high end of the range puts the strap around his neck or on just one shoulder. Bend your legs as shown in the center photo; straighten them to lift. The man on left has part of the weight on the lower portion of his body. Refrigerators can be carried the same way as a range..

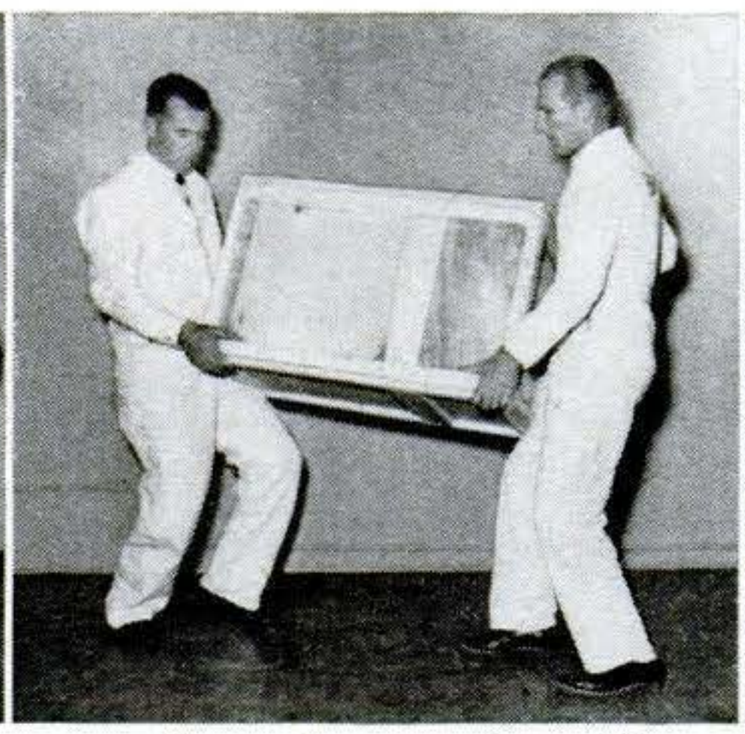
Copyrighted material

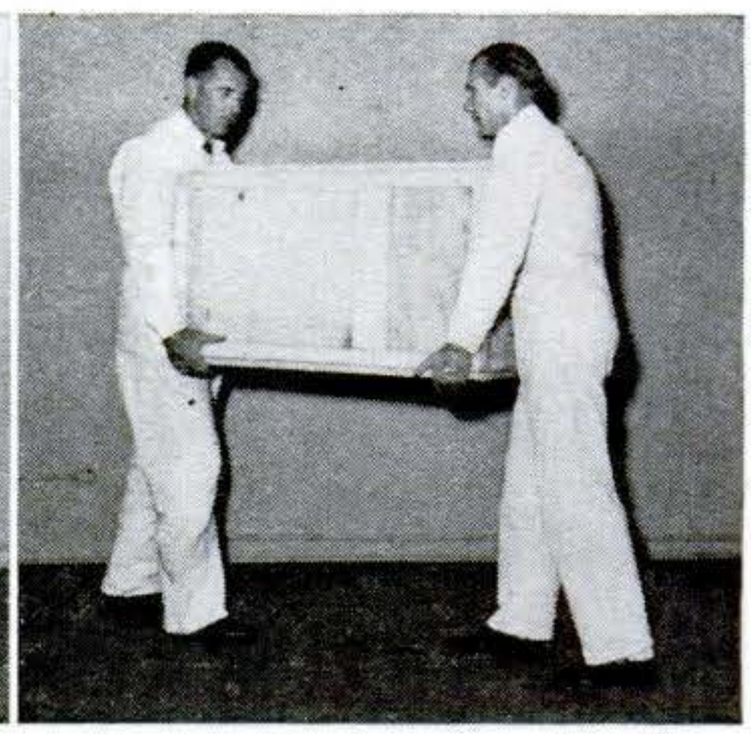


To tote TV sets, use a helper and a pair of straps. Carry set vertically at all times; otherwise you may knock tubes askew. Once on truck, wrap it and load so that screen isn't subject to pressure. The set can go under other things if the cabinet is strong.

Heavy chests, awkward to carry with hands alone, are no problem if one man uses strap. Lift chest tilted toward strap, as here, and also tilted back so that drawers won't open. For maneuvering around corners, it may be best to tie drawers shut. They are a good place for carrying draperies and curtains—rolled, not folded, to avoid creasing.







Two men can carry loaded boxes and trunks as heavy as 300 lb. like this. One hand on back edge tilts box back until second hand can grasp bottom front edge as at left. Men lift together, rest load on thighs (center photo) and shift rear hands down to bottom corners for the carry. On stairs, taller man should take lower end to keep load as level as possible. To set it down, one man shifts rear hand back to top, shifts other to let corner down to floor, and both men lower weight by bending legs. Never carry a heavy load behind you.

sprint. Be stingy with your energy, saving the old heave-ho for the times you really need it. Headwork can save you a lot of hard labor, even in the little jobs. For instance, don't punish yourself by wrapping small items on the floor, taking the stance of a bowknot to do it. Work on a table, and sit down to as much of the job as possible.

Things weigh less if the extras are detached. Legs usually come off tables if you unscrew one nut apiece. Gas grates and burners lift out of the range, and heavy chests don't have to be moved with the drawers filled.

If burners, refrigerator shelves, radiant-heater units and the like aren't removed from their housings, immobilize them with paper stuffing so that they won't be damaged or mar adjoining surfaces.

Stowing the load. You wouldn't put eggs under canned goods in a shopping bag, and the same principle applies in loading house furnishings. A fragile end table isn't worth much when it has traveled under a davenport or a steamer trunk. A good mover loads with his head as well as his arms.

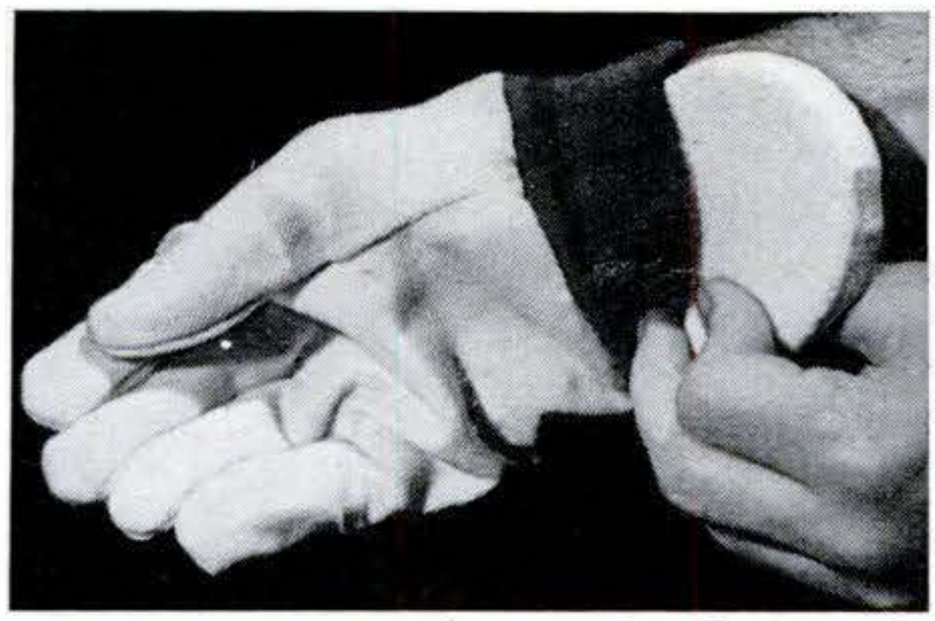
Bekins drivers say: "The secret of good loading is planning. Think from the top down. What are the key pieces—the awkwardly shaped or fragile ones that offer the greatest problem? Pick other pieces of the right width, strength and height to form a base for these and protect them."

Remember that blankets or pads should be wrapped around vulnerable pieces to keep them from being jarred on the trip.

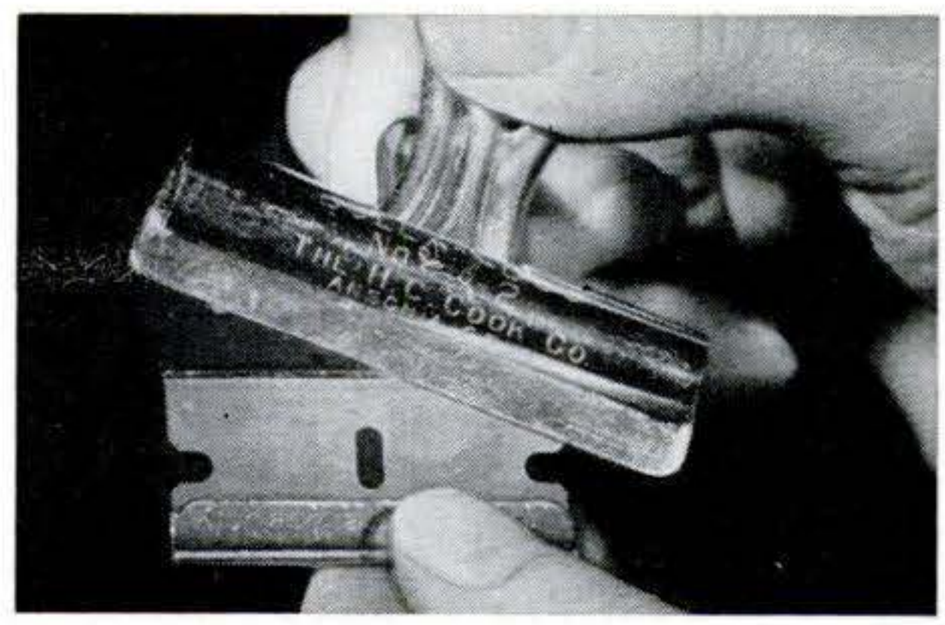
Good moving! END

Copyrighted material

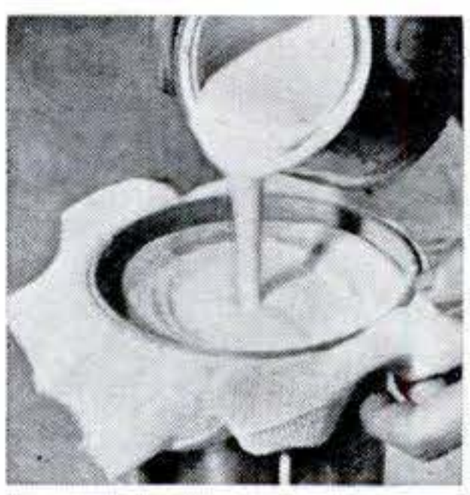
DO IT THE EASY WAY



To stop blisters if your hands haven't toughened up, slip sponge-rubber powder puffs into the palms of work gloves. Anchor with adhesive tape.

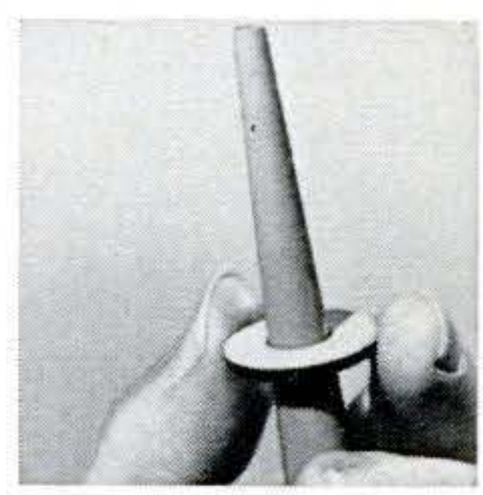


To store a razor blade safely in a desk or cabinet drawer, clamp the cutting edge in a spring-type paper clip. Reverse the blade for cutting.

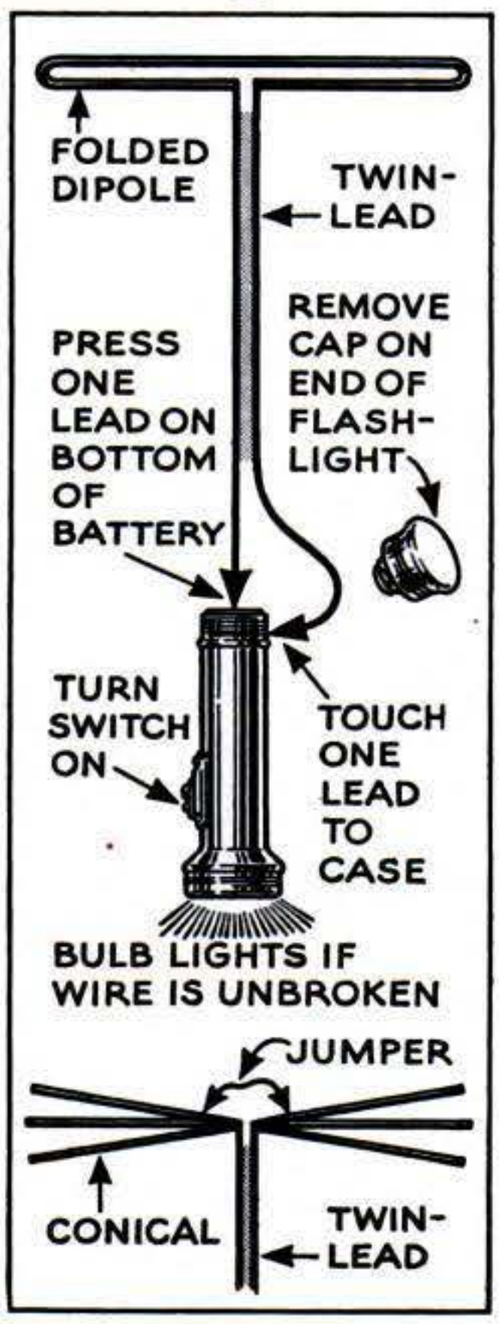


To strain paint, hold the cloth almost taut between embroidery hoops large enough to fit over the top of the can. Then the weight of the paint won't drag the cloth into the can.

To catch drips of oil that run down the spout and over the sides of an oil can, solder a washer to the spout. It will intercept drips, letting you wipe them away before they dirty the can.



Flashlight Tests TV Lead

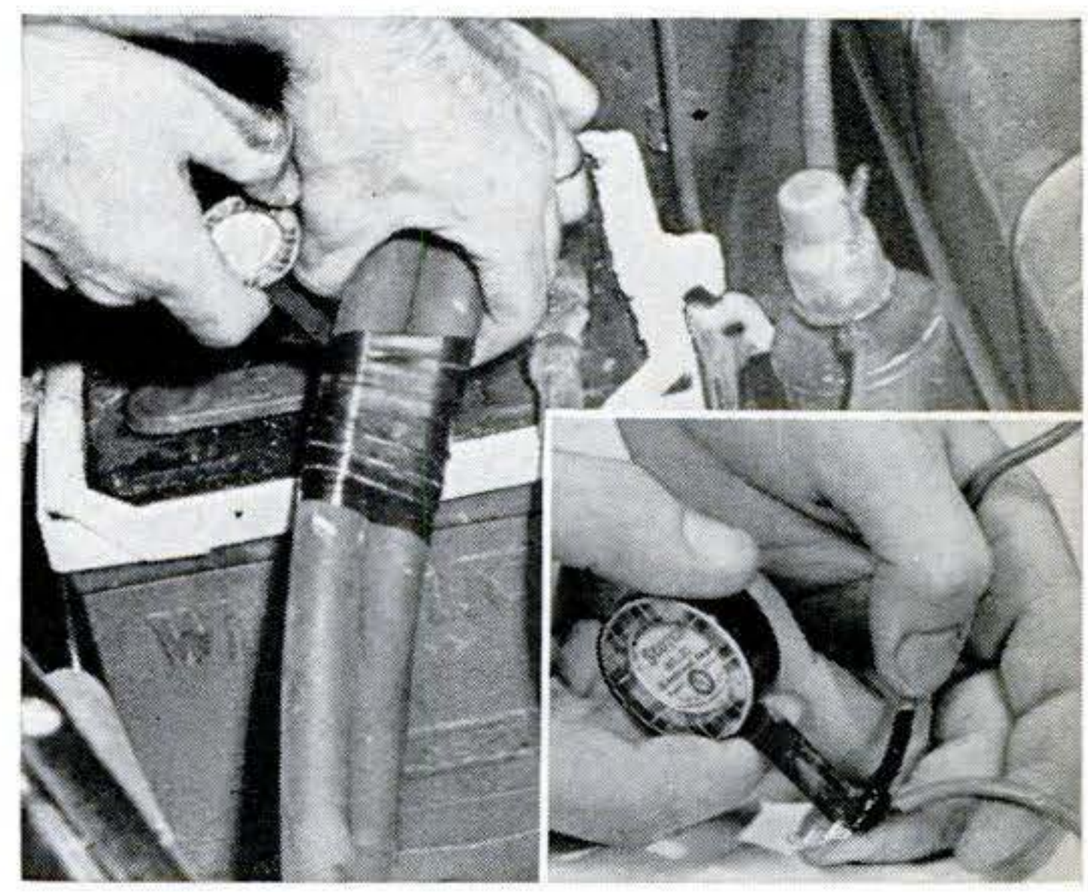


THE twin-lead ribbon that connects your television antenna to the set takes a beating from the wind and rain. If you suspect a break in the down lead, disconnect both wires from the set and find out for sure with the simple flashlight test shown.

If you have a folded-dipole antenna, you can make the test without going out of the house. If not, connect a jumper across the arms to complete the circuit. — *Arthur Trauffer, McClelland, Iowa.*

Neg Envelope Softens Flash

TRANSPARENT photo-negative envelopes jammed over flashbulbs make excellent diffusers when you are shooting a close-up and want to soften the illumination.



Electrical Tape Fills Two Jobs

AN ELECTRICAL tape of glossy black plastic that sticks on contact eliminates the need for double-wrapping splices with rubber tape and ordinary friction tape. A rubber-like ability to stretch over twice its length makes it conform smoothly to odd shapes. Though unusually tough, it's only .007″ thick and makes a neat wrapping in tight, small places. It's waterproof and unaffected by oils, acids, prolonged sunlight or intense cold. Marketed by the makers of Scotch tape, it has Underwriters Laboratory approval.

Copyrighted material

Copyrighted material

How to Photograph Your Boss

By Ralph Steiner

SOONER or later, every photographer who is worth his hypo is called on to photograph his boss. That's one of life's grim realities, so you'd better give it some thought right now and be prepared to do it well. Otherwise, that next raise in the paycheck may not come nearly so soon.

Successful men have to do a lot of posing for pictures, and successful men hardly ever feel comfortable when facing a lens. I know, because I've dealt with and photo-

Harold Renfield, liquor importer, freezes for lenses. After I'd made 54 shots, all unlike him, he suddenly unfroze, and the next six shots were easy, informal, happy likenesses.

Clarence Randall, boss of some 25,000 muscular workers at Chicago's Inland Steel, was no problem once I'd coaxed him out of his office into the plant. The photo was shot for *Fortune.*

Louis G. Cowan, radio and TV producer, relaxes way, way down. "Just keep on reading," I told him as he sat with the paper. "I'm doing you as Whistler's Mother." He did. And I did.

graphed a lot of them in my time: Wilson of AT&T, Wilson of General Motors, Greenewalt of du Pont, Folsom of RCA, and many others.

And I've made a lot of mistakes—so, at least, I can tell you what not to do when the day comes that you have to shoot (I mean, snap) the big boss.

Don't Shoot and Run

First, don't make the mistake the plant photographer is so often trapped into. Don't let the boss give you two minutes to shoot and run. The president of Procter & Gamble showed me some rather terrible shots of himself and wondered why they were so bad. I thought I knew. The blame, I told him, probably should rest squarely on his shoulders, not on the photographer's. "How so?" he asked. I closed my eyes and said: "I can see it all in my mind's eye—just how these pictures happened. You pulled your brass on the cameraman, told him to make it snappy. Several electric signs flashed on in the photographer's mind: 'TIME SPELLS TROUBLE,' 'FOCUS, THEN BANG THAT FLASHBULB,' 'GET OUT FAST.'" My guess turned out to be right.

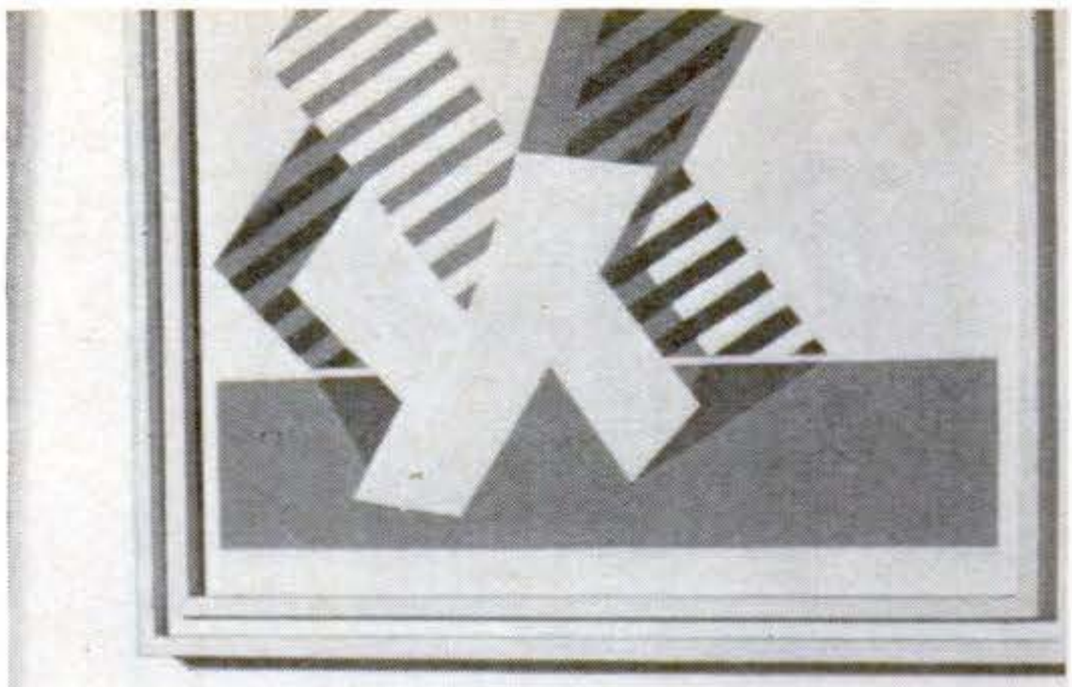
Film, lens, shutter, flashbulbs operate mechanically, but there's a law that says that to make good photographs a photographer must use brains. And if you inspect the small type in that law, you'll undoubtedly find "the more brains the better the picture." Eastman Kodak up to now hasn't invented a robot photographer.

How do you apply photographic brains? You have to defeat what might be called the First Gambit, or the Challenge. I meet it whenever I enter a man's office with a camera. He tightens up, hunches his shoulders, gets more sticklike. Or he leans back, pokes his stomach out in my direction and molds his face into an expression that says: "I dare you to take a good portrait of me." In this state he's not fit for anyone's camera. But don't flee. I used to want to. Now I've learned that his rigor comes not from being bearish but from being scared of what the man behind the camera will do to him.

Decoy Diverts Subject's Attention

At this point the books on portraiture advise you to make your subject relax. Easier said than done. Unless you are a Durante or a Bob Hope and can fascinate the boss while making decisions about background,

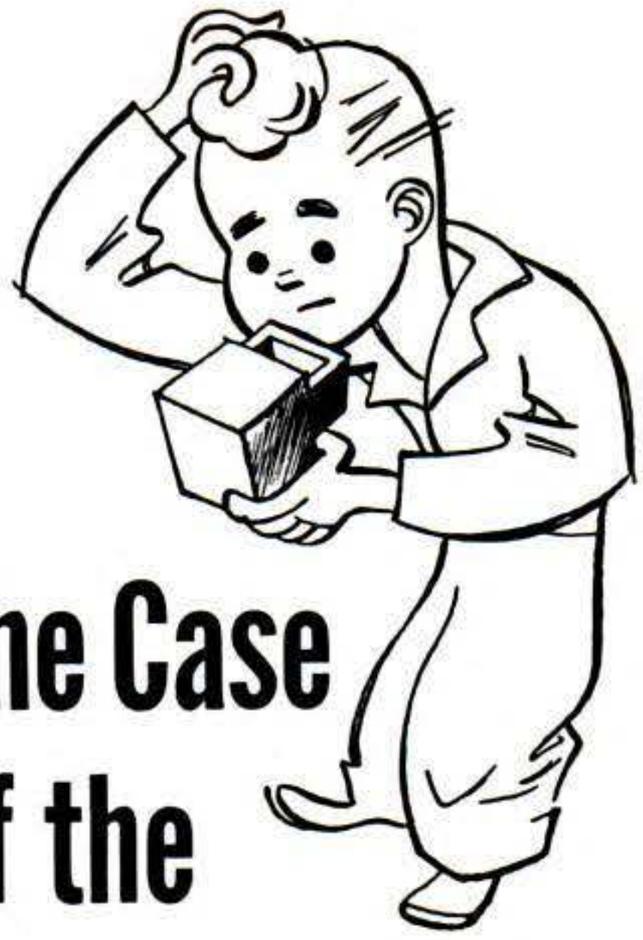
[Continued on page 262]



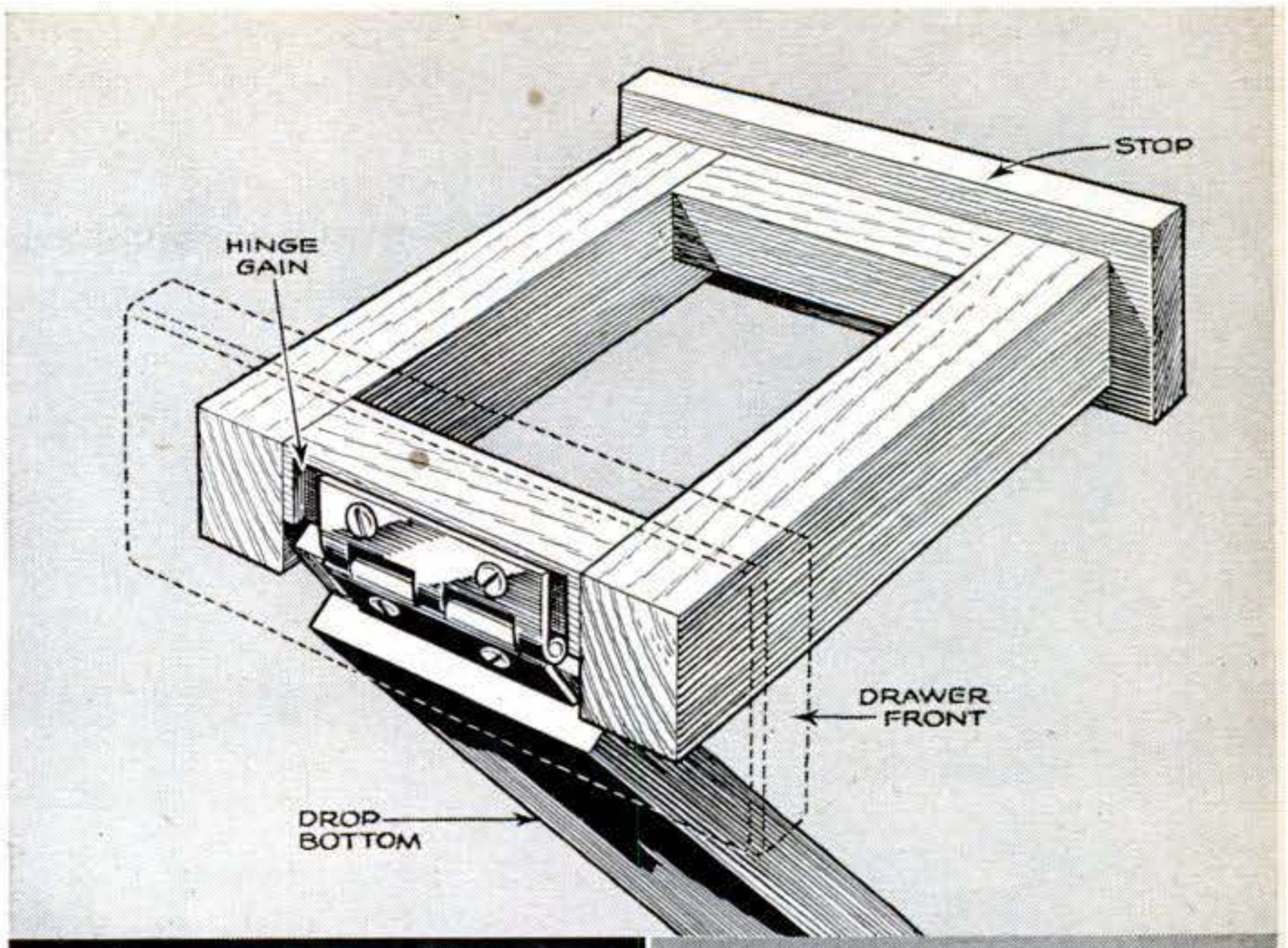
William Lescaze, New York modern architect, is a natural. Accustomed to public speaking, he sits and looks happy for photographers. I took him with one flashbulb in an all-white room.

Paul Newman, a New York advertising vice-president, is a crack shot and hunter. I tried to show that things keep moving in his head and he always looks cool, starched, shoeshined.

Copyrighted material



The Case of the Vanishing Coin

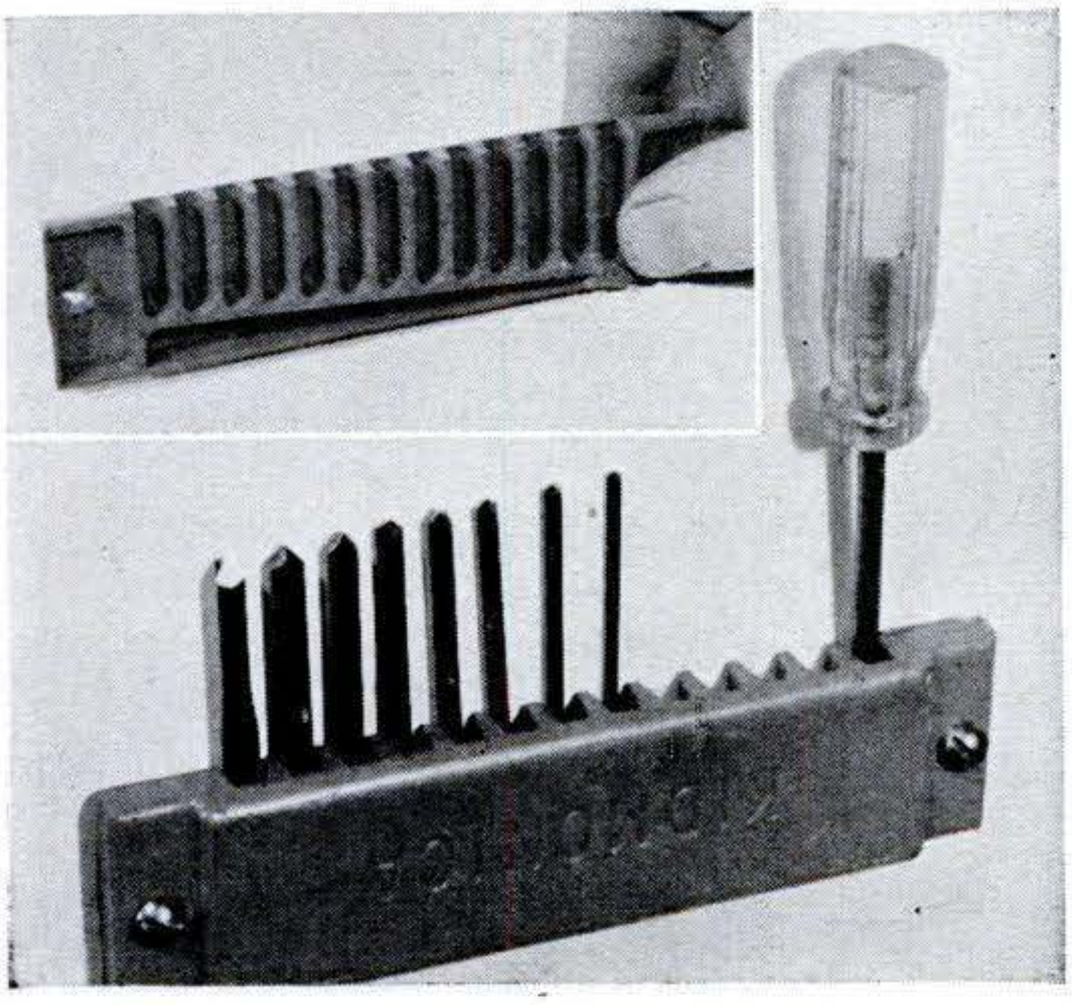


FOUR bits dropped into this novelty bank disappear faster than a buck at a supermarket, but you get more fun out of it because you've still got the dough.

Only the top drawer of this miniature chest slides in and out; the others are dummies. Pop a coin into the drawer, close it, and a hinged bottom lets the coin fall into the chest. Reopen the drawer, and the bottom snaps up into place again, leaving no clue to the coin's disappearance.

A trick drawer like this can be built into any sort of box or miniature furniture. The back stop, which keeps the drawer from being pulled out far enough to tip its gimmick, must be attached with the drawer in place. In the chest shown, this was done before the top was nailed on.

To withdraw your savings you could burn up the bank or use an axe, but it's better to have a trap door. Here, it's the bottom of the chest. The crosspiece of a cylinder lock straddles cleats inside to hold it in place.—*J. R. Schneider, Larchmont, N. Y.*



Harmonica Makes Drill Rack

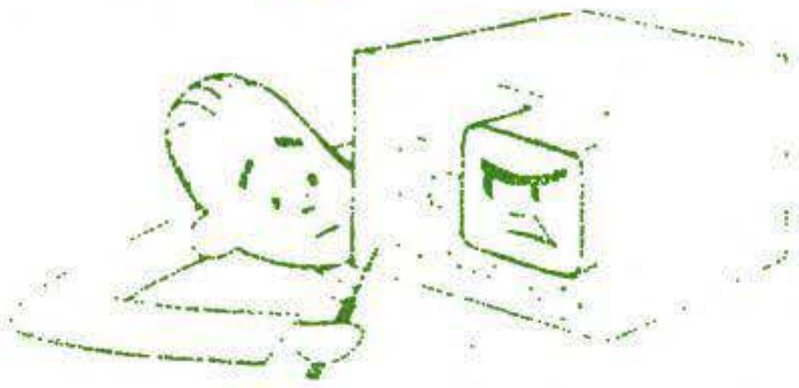
THE cover of a 10-cent plastic harmonica will neatly rack up the drill bits and blades for an automatic screwdriver. Pry the toy apart carefully with a knife blade and mount the cover on the wall of your shop with wood screws.—*John J. Rea, Urbana, Ill.*

Work Gloves Always at Hand

I NEVER have to look for my work gloves any more. To keep them always with me when dressed for work, I sewed one clasp of a snap fastener to each glove and the opposite parts to my coveralls. When I take my gloves off, I just snap them to the coveralls. —*Charles O'Brien, Birmingham.*

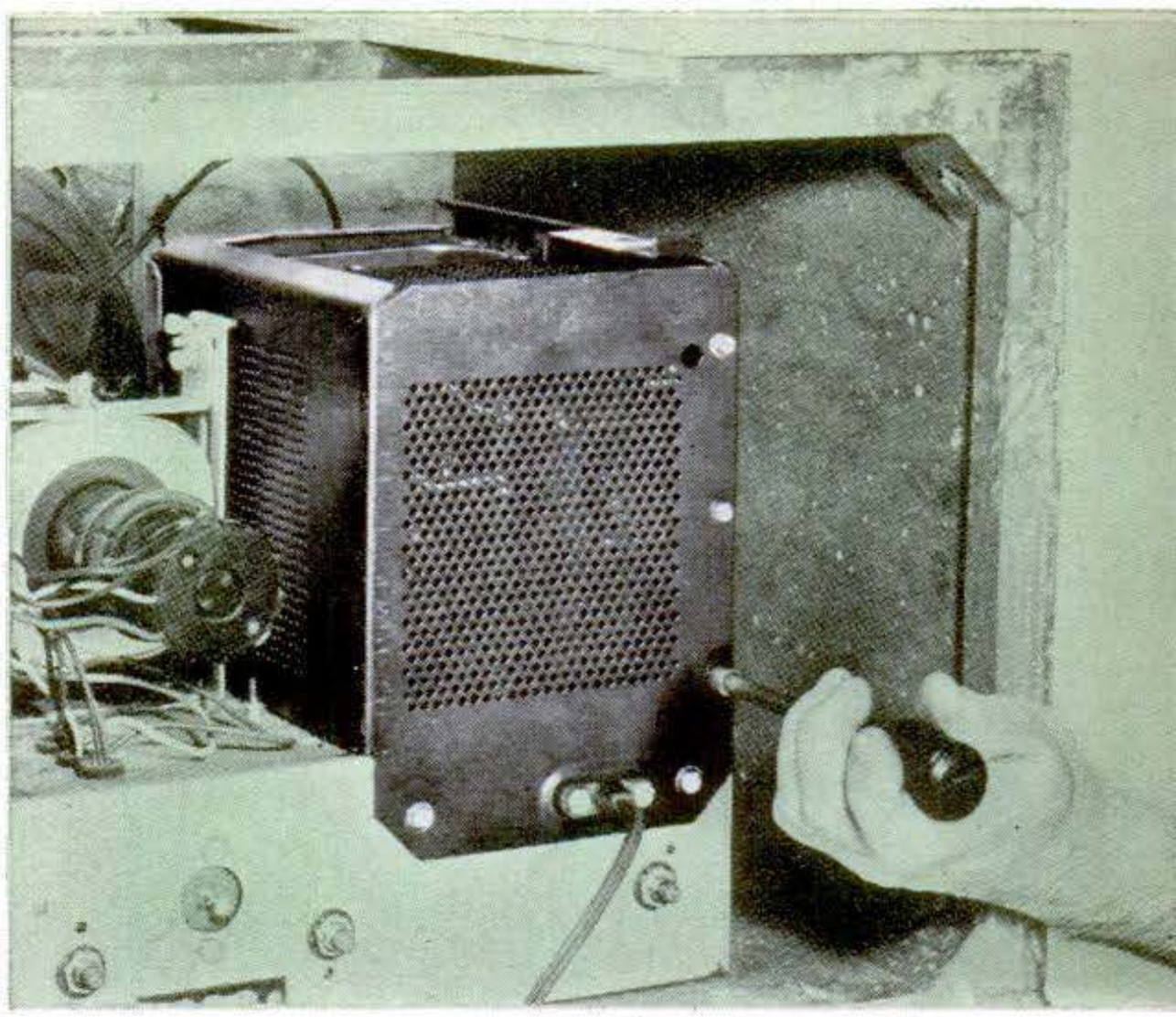
Copyrighted material

What's Inside a TV Doghouse



Take a look and see. You won't get bitten if you know how—and it's where you're most likely to spot set trouble.

By Robert Hertzberg



To get inside doghouse on the common 630-type chassis, use a small socket wrench to remove screws in back. Line cord is disconnected.

ALREADY TV sets are sprouting their own folklore. One notion kicking around is that anyone who isn't an electronic expert should never go near the "doghouse"—that little steel box on the chassis where the high voltage lives.

Don't you believe it. The doghouse need not be dangerous. And the amateur repairman who avoids it may be missing a bet, because the tubes in it are among the most vulnerable in the entire receiver.

If the other tubes are working all right (see PS, April '51, p. 209), and if the sound is coming through, a dark picture tube can be traced directly to the doghouse in 99 cases out of 100. As a matter of fact, you *ought* to be familiar with the doghouse in your set. Otherwise, something like this may happen:

One day the picture tube goes blank. You check the line cord and antenna; all okay there. So you pull the chassis and check the tubes outside the doghouse; all okay there. "Oh-oh," you say, already feeling pain in the pocketbook, "the picture tube's blown." Then you call the serviceman. He replaces a bad tube in the doghouse and the set works fine. It leaves you with a why-didn't-I-do-that feeling.

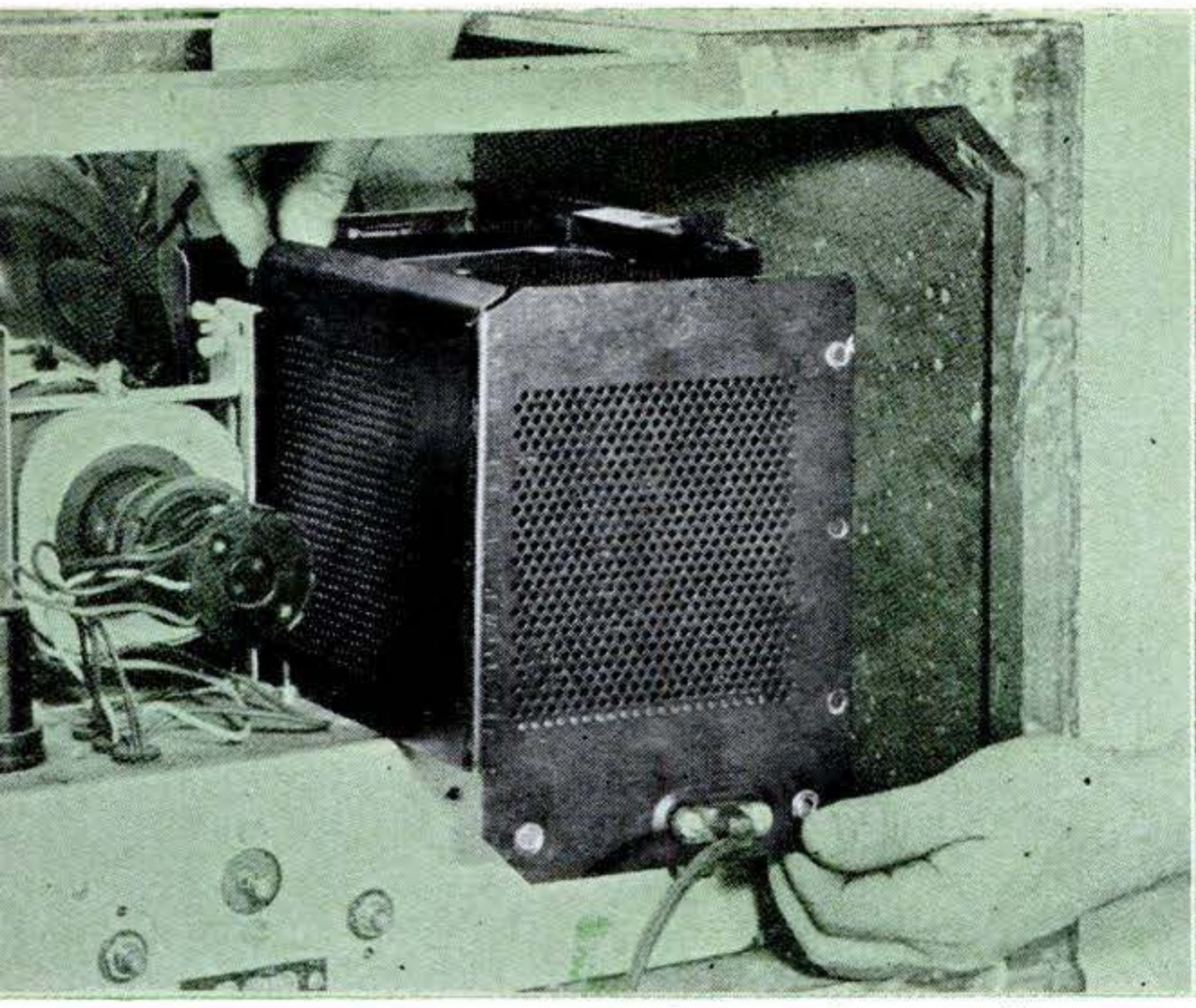
Safety Rules. Nobody wants to scuffle with 15,000 volts. So make it a rule not to plug in the set with the doghouse open. There's one exception to this—when you want to see if the doghouse tube filaments light up—so be particularly careful to keep your hands out then.

The second rule is to discharge the high-voltage condensers in the picture-tube circuit after you turn the receiver off. Locate the single well insulated wire from the doghouse to the side of the picture tube and pull it free where it joins the tube. Allow the fastener at the end to touch the chassis, thus discharging the high-voltage condensers. You may see small sparks jumping to the chassis. Be sure to put the cap back before you turn the set on.

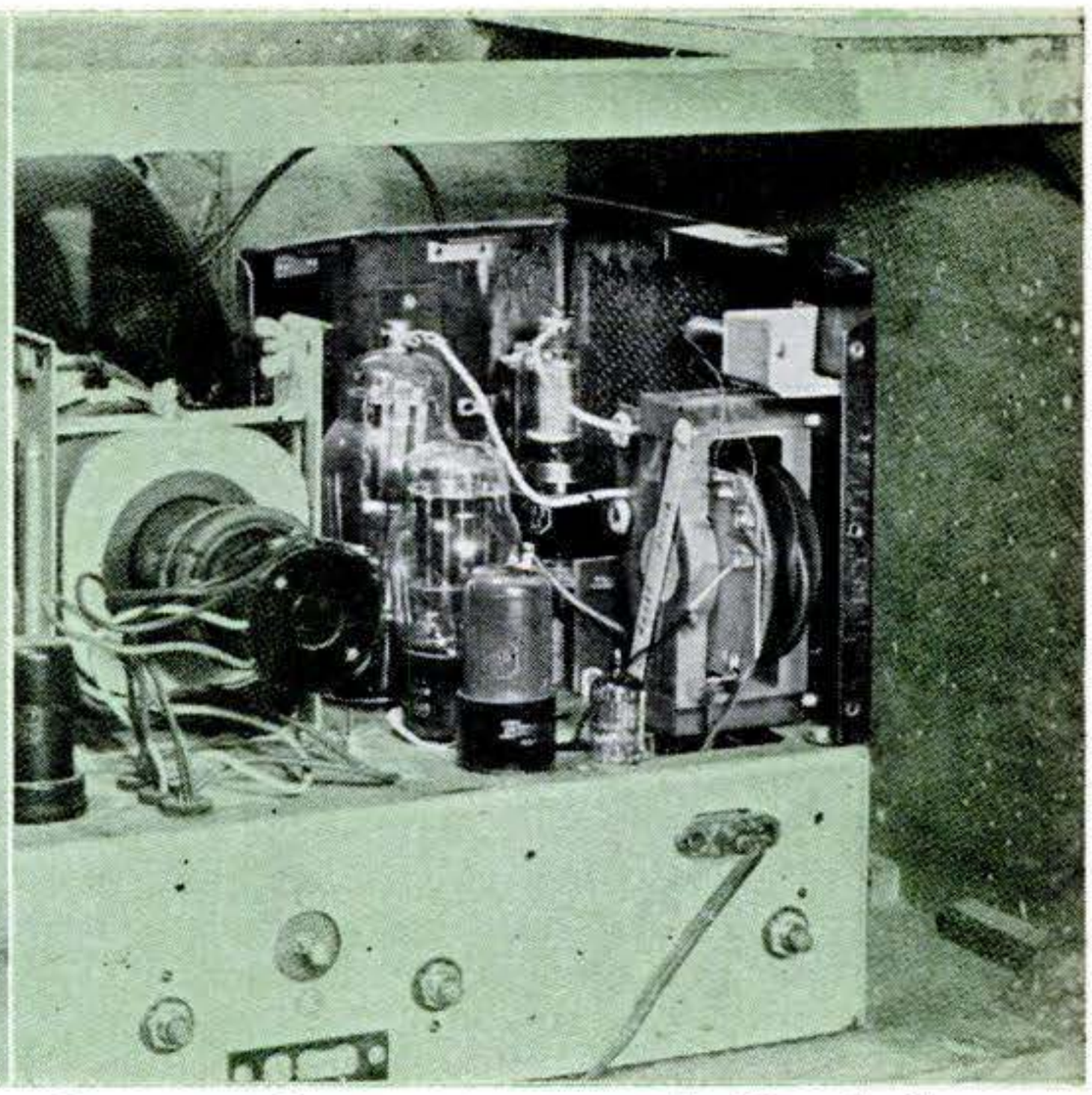
What you need. A few common hand tools, the manufacturer's service notes for the set, and possibly a "cheater" are all that's necessary for troubleshooting in the doghouse. The service notes are important, as is a tube manual that lists the tube heater pins, allowing you to make a simple series check of the filaments. A cheater is a length of 115-volt wire with a plug on one end and fittings to match the set's power-supply connection at the other.

Doghouse construction varies considerably. In some receivers the compartment has a simple cover that yields readily to a screwdriver or pair of pliers. In others, you may have to remove eight or ten screws from the sides and edges. Some newer sets compartmentalize the doghouse in an area under the chassis. In most sets the power

Copyrighted material



Back and top now slide free. Line cord comes off, too. If you don't have "cheater," drill out rivets connecting plug to the cover.



Parts inside are now exposed. Freed plug now acts as "cheater." **Keep hands off with power on.** Replace rivets with screws on reassembly.

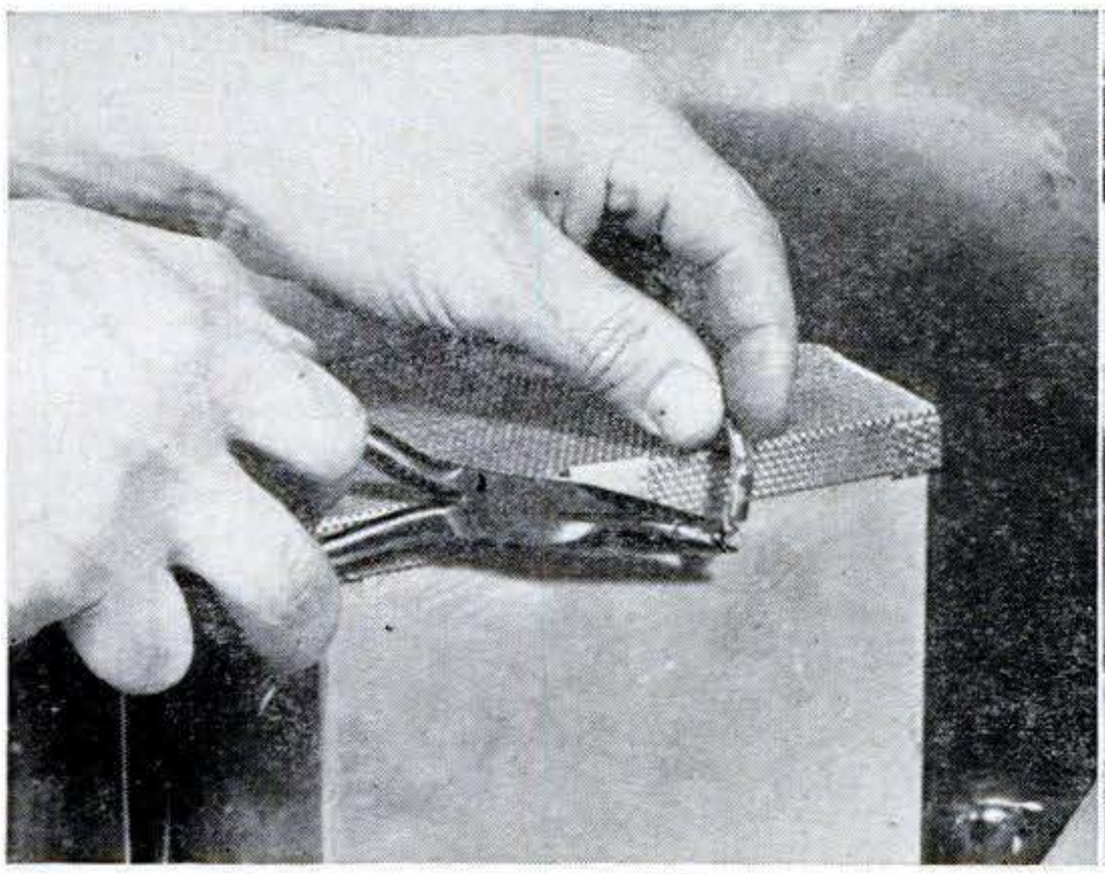
cord comes off with the rear chassis guard or the doghouse cover.

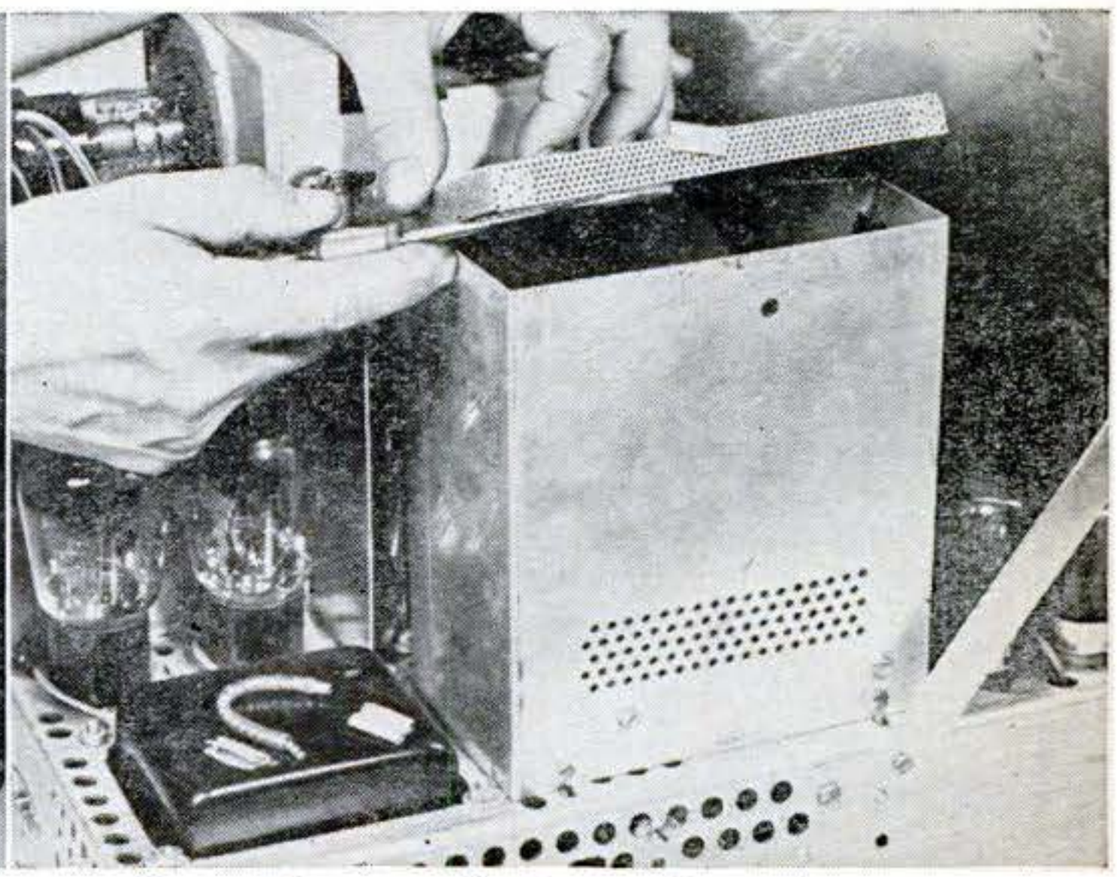
Dust it out. The first thing you'll notice is the thick coat of dust inside the doghouse, attracted by the heat and high voltage. Clean out the box with a soft paintbrush, but don't wield it too vigorously. Now plug in the set, turn it on, keep your hands well clear, and take a good look at the tubes.

You can pretty well expect that the high-voltage rectifier, which you can identify from the service notes, will be dark. In many sets this is a 1B3GT. Remove it and make a continuity check of the filament (a series link-up of a single dry cell, a pair of earphones, and the filament pins is one easy way). If its filament tests "open," the tube is simply burned out and a new one is needed.

Circuit oddity. It is entirely possible, however, for the tube to be in good shape. Then a brand-new 1B3GT put in the same socket will likewise fail to light. This is due to an oddity of many TV circuits.

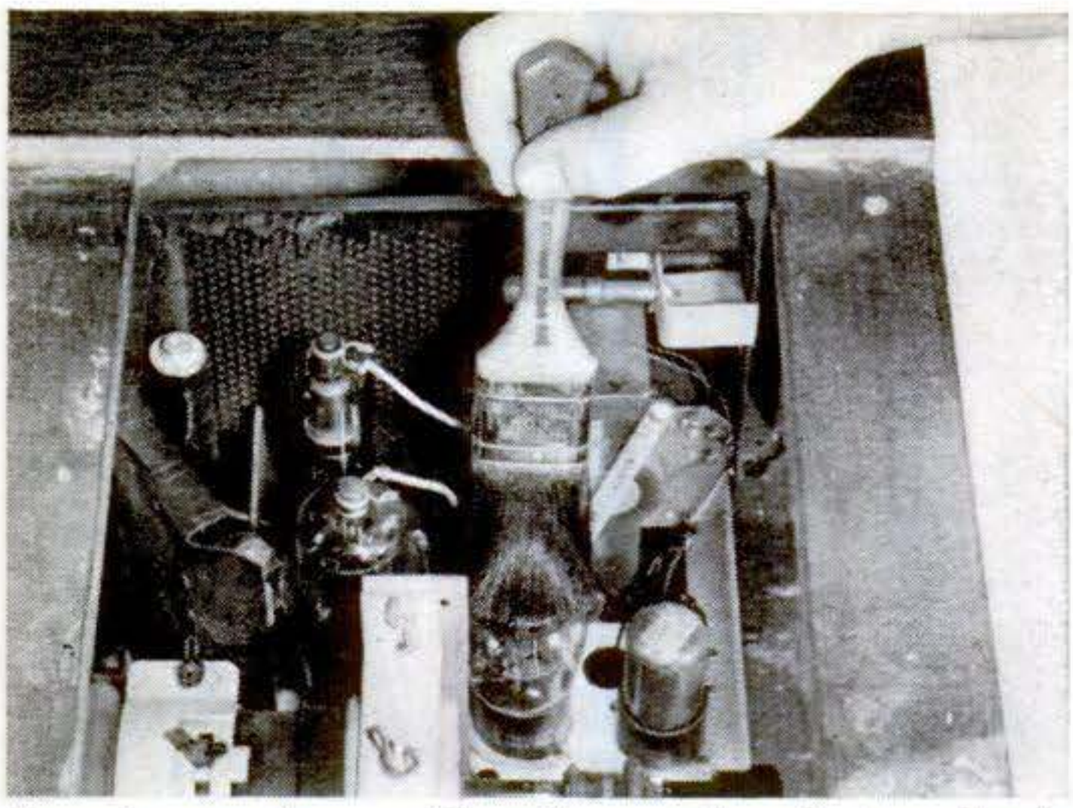
In most sets, all tubes except the high-voltage rectifier receive their filament current from the low-voltage windings on the regular power transformer. The rectifier gets its filament current from a special transformer associated with a tube marked



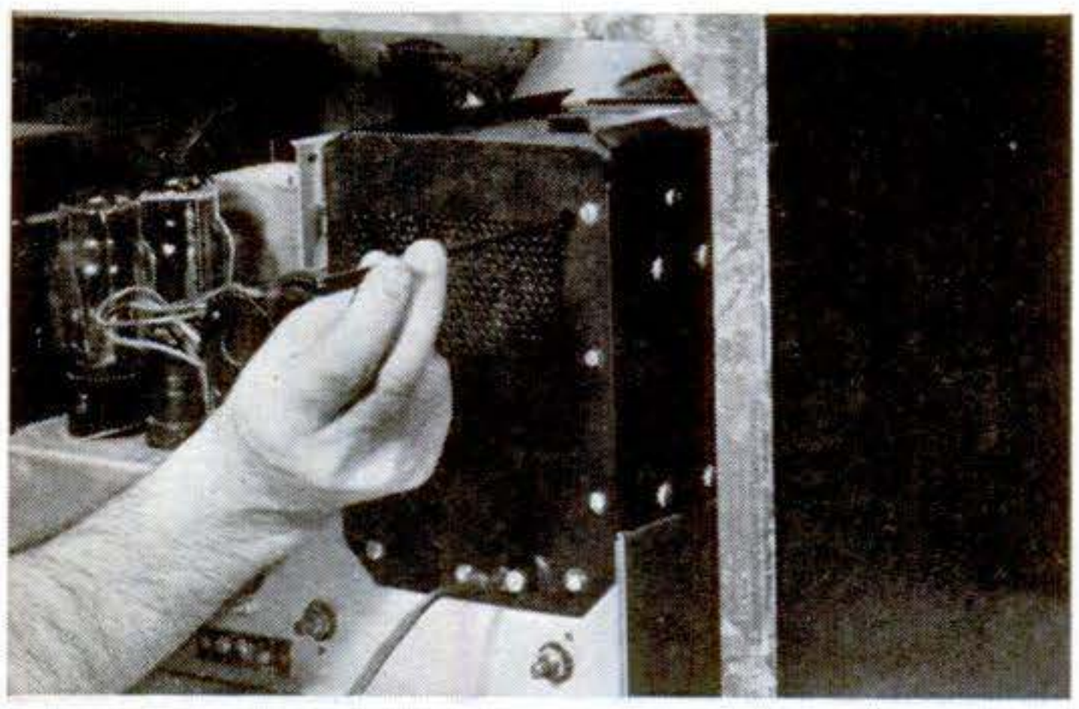


Can-type doghouse is opened by removing ball chain and gently prying off lid. Be sure juice is off, condensers discharged. Take care not to bang lid or tools against picture tube.

Copyrighted material



Brush out dust with soft paintbrush, but don't injure fragile leads. Leave wires in same position you found them. If a tube has a spring socket, press collar on base to release it.



Slender plastic screwdriver is used to adjust width or linearity control in doghouse. This is done with doghouse reassembled and power on. **Never use a metal tool for this job.**

either "high-voltage oscillator" or "horizontal sweep output." If this tube goes bad, the rectifier gets no filament juice and fails to deliver high voltage to the picture tube.

Tube failure means more than just a burned-out filament or heater. It is common in TV servicing to encounter tubes that light normally and yet simply refuse to work in certain critical positions. Among these are the oscillator and horizontal output stages, the usual tenants of TV doghouses. It isn't uncommon to find an oscillator tube that decides to stop oscillating after a year or so, although it does fine if switched to the sound end of the receiver.

After replacing doghouse tubes, be sure you remember to replace the high-voltage lead to the picture tube that you pulled to ground the condensers.

In most TV sets, replacement of the doghouse tubes won't require readjustment of the various picture controls. At most, slight readjustment of the focus control may be needed. In some sets a control marked "linearity" or "width" is inside the doghouse, and is accessible through a small hole in the case. After you have the set buttoned up again, tune in a test pattern and, using an all-plastic screwdriver, carefully adjust this control. As with other picture controls, it's smart to mark the adjusting screw's original position before you change it. END

Got a sick car radio? See PS next month for simple ways you can cure it.

VACUUM CLEANER

If it will not pick up (upright type), the cleaner bag may be filled or badly clogged. The rotating brush may be worn or improperly adjusted so that it does not brush the surface being cleaned. The brush drive belt may be loose or broken. The nozzle may not be adjusted to suit the floor being cleaned. Adjustment is correct when a half dollar can be slipped under the nozzle edge between the nozzle and the rug. Low motor speed will reduce cleaning efficiency. If the motor runs slowly, it could be because of bad bearings, worn motor brushes or poor motor connections.

If it will not pick up (tank type), the cleaner bag or filter may be clogged. The wrong cleaning tool for the job may have been selected. The cleaning tool may be improperly used. Light pressure and slow, steady strokes do the job better than heavy pressure and rapid strokes. Low motor speed will reduce cleaning efficiency of this type too.

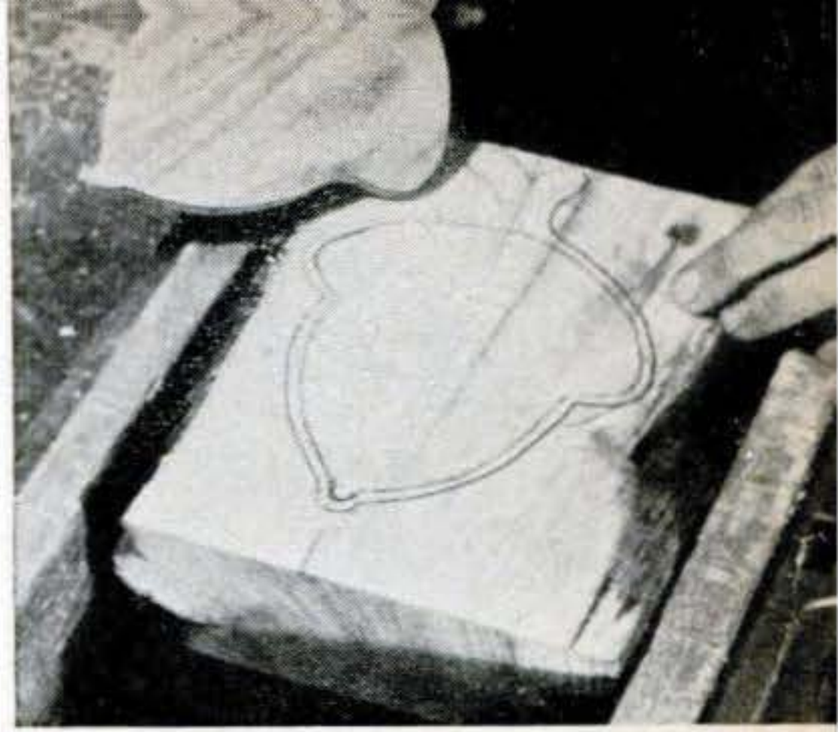
If it will not run, there may be an open circuit to the cleaner motor. First make sure the house circuit itself is not at fault. The break may be in the plug, the cord, the switch or the motor. In the motor, an open circuit could result from a broken wire, loose connections, worn brushes, worn or dirty commutator or open field.

If it is noisy, the bearings may be dry, tight or worn. The motor armature shaft may be bent so that the armature is rubbing on the pole shoes. A loose, bent or broken fan will cause excessive noise. On the tank type of cleaner with two fans, noise may result if the fans are out of balance. They can be balanced by loosening the fan nut and turning the outside fan one-eighth turn, then tightening the nut again. Repeat until the cleaner runs quietly.

(From *Electrical Appliance Servicing,* by William H. Crouse.)

FOR YOUR POPULAR SCIENCE INFORMATION FILE

Copyrighted material



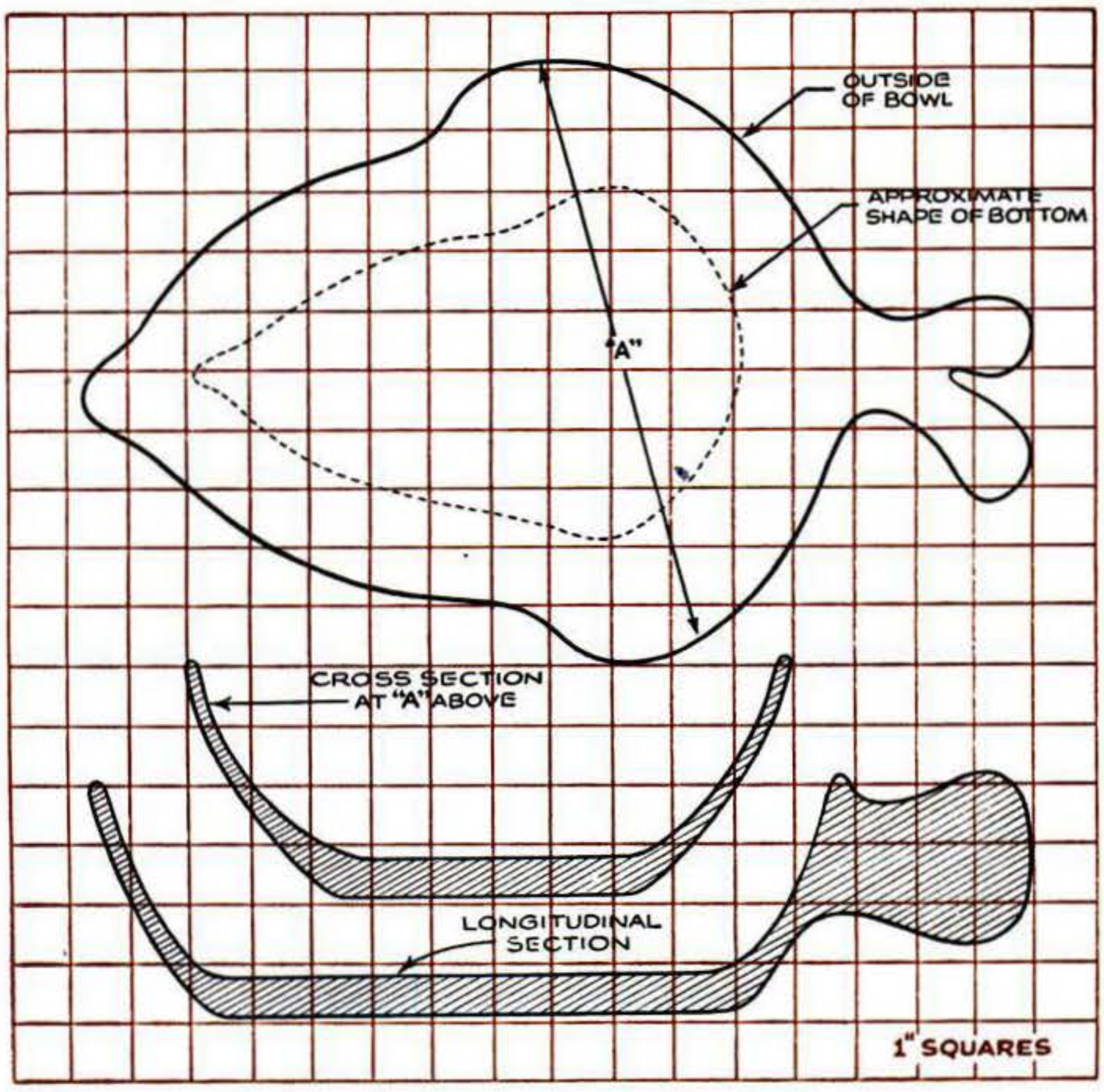
1 Mason first draws the outline of the bowl, using separate templates to mark the inner and outer edges. He uses a third template on the underside to outline the bowl bottom.

How a Craftsman Carves a Bowl

It takes effort, but the handsome results are worth it.

SHAPING bowls from many varieties of wood has been a long-time hobby of Edward H. Mason, supervisor of the Roosevelt National Forest. He admires the rich grain and color of fine wood and enjoys ferreting delicate shapes from twisted branches and knotty pieces. He does all his carving by hand. The photos here and on the next page show the steps by which he turns a slab of hardwood 2″ thick into the handsome acorn bowl above.—*David F. Costello, Ft. Collins, Colo.*

2 Carving can start anywhere along inner line. Mason first makes shallow cuts, then works down steep-sloped sides. As he nears the bottom he checks the depth with calipers.

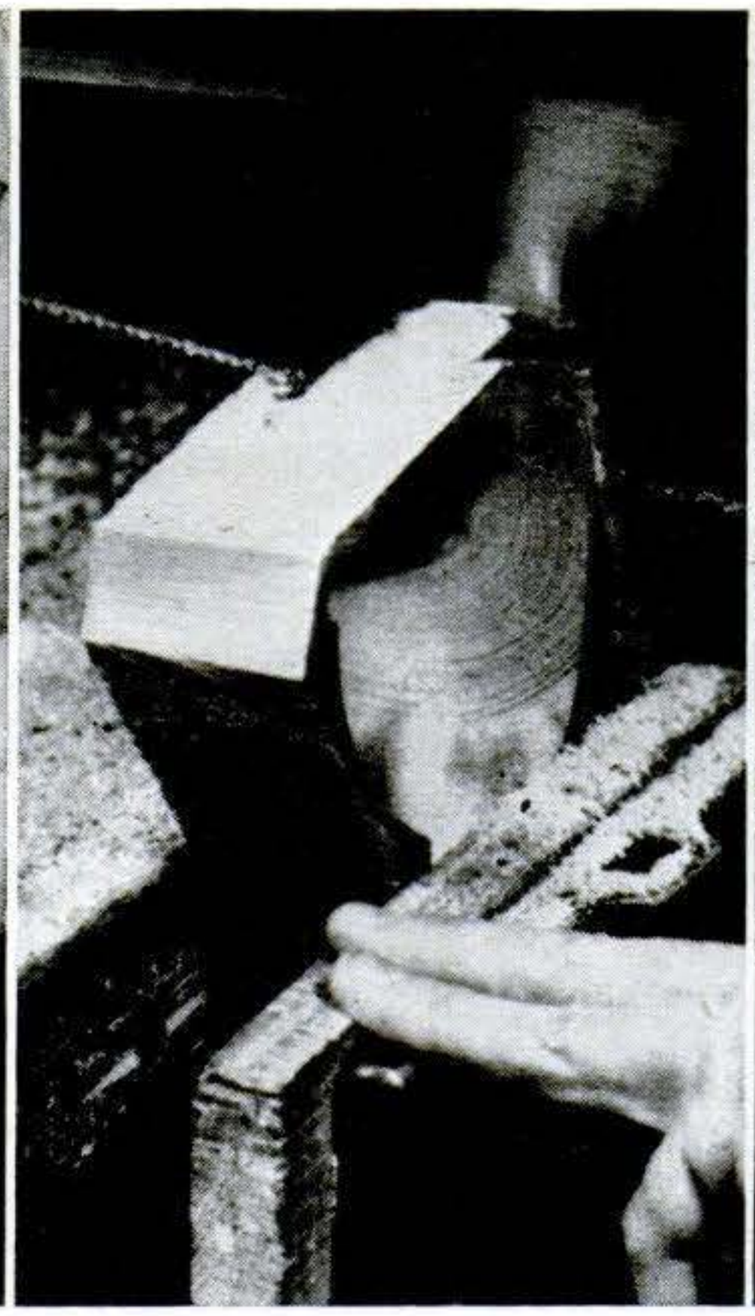


3 An electric hand grinder quickly smooths the gouged-out sides and bottom and shapes a lip at the tip of the bowl so that it may be used for pouring.

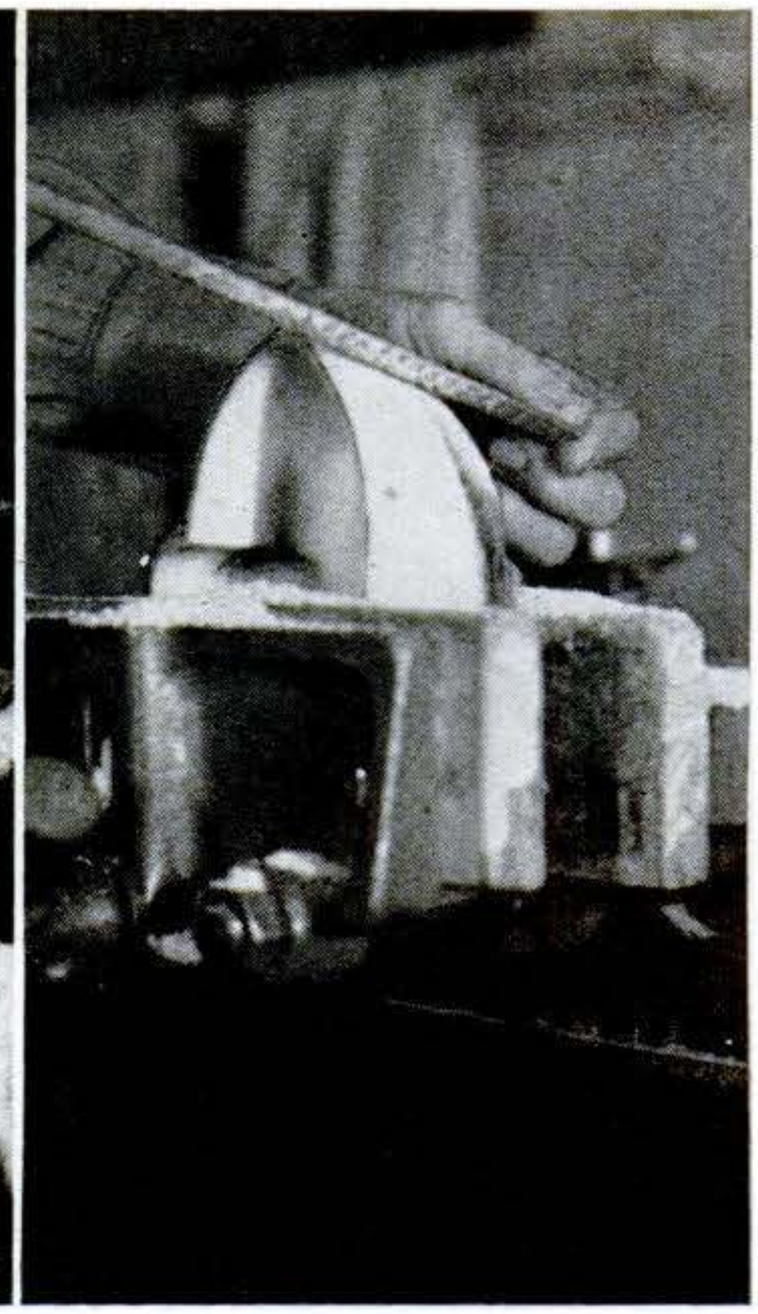
[*Please turn the page.*]

Copyrighted material

4 Inside of bowl is sanded smooth and a coat of lacquer filler is rubbed in. Mason finds it more convenient to finish the inside before starting to shape the outside of the bowl.



5 Roughing the outside. Mason uses a handsaw, then a coping saw to hew off surplus wood until a crude outline of the finished bowl begins to appear. Gouges help on some curves.

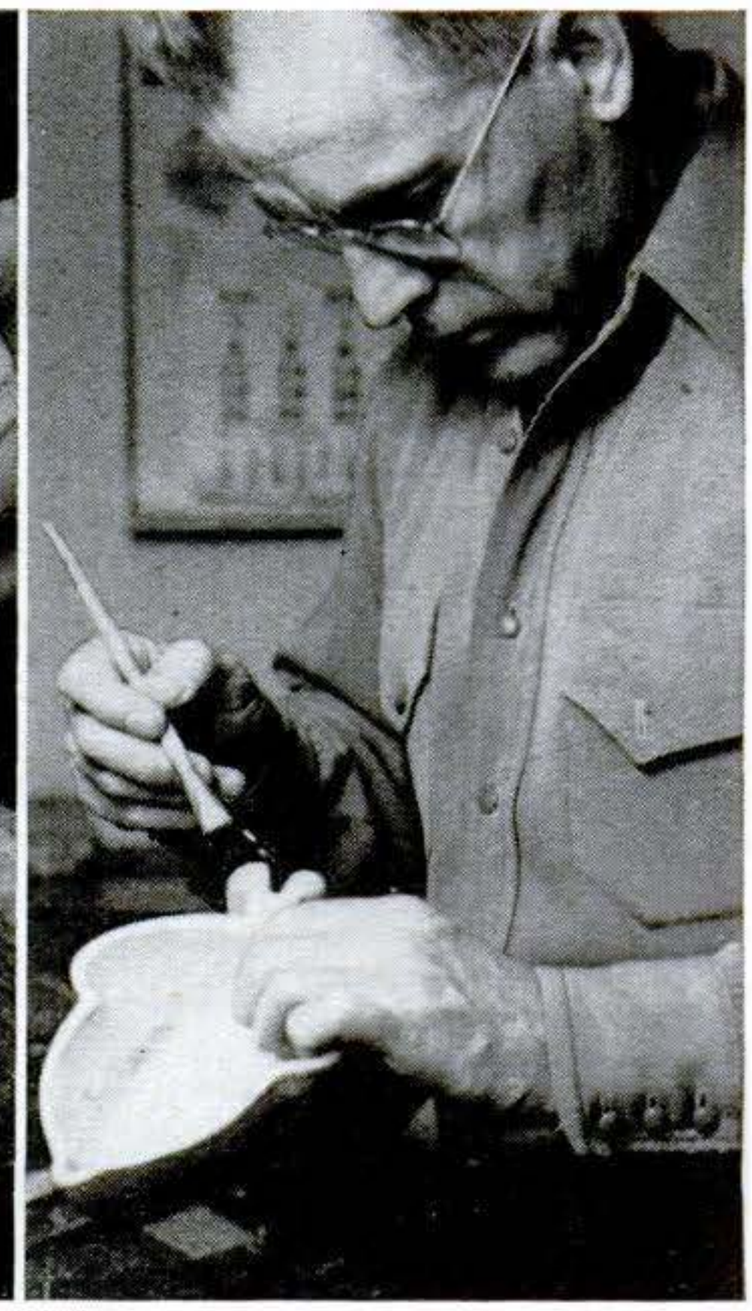


6 The outside is shaped with rasps until the edge is ⅛" thick and the bottom ¼". He's careful to caliper the work frequently, especially toward the end. Sandpaper smoothes the rough rasp bites.

7 The handle is left to last and it, too, is shaped in stages. First the coping saw follows the outer curving lines, then small rasps cut in details and round off the outer surfaces.

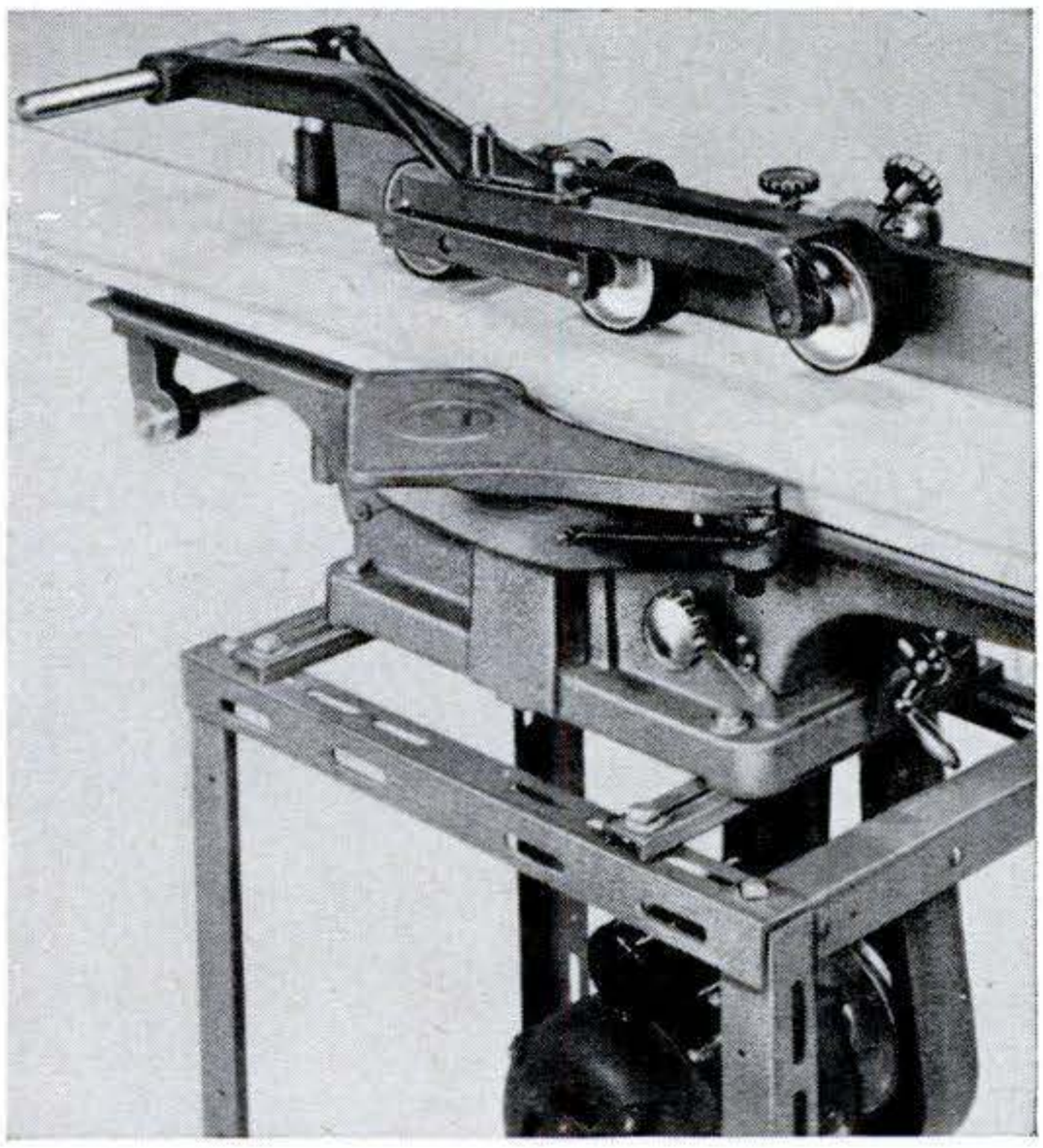
8 The electric grinder completes the shaping and evens off all rough spots. The handle and outside of the bowl are then ready to be sanded, coated with lacquer filler, and sanded again.

9 The finish coat. Mason sometimes brushes on white shellac, sometimes rubs in powdered pumice and castor oil. Both finishes emphasize the color and grain texture of the natural wood.



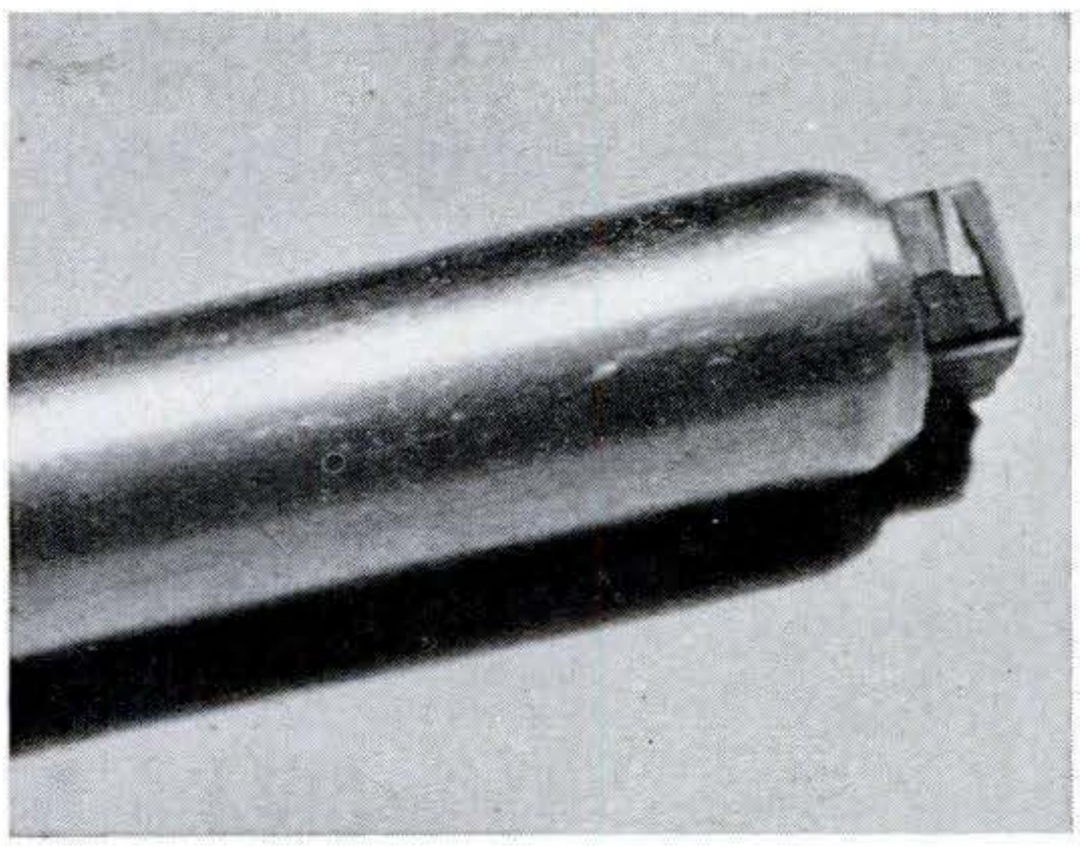
Copyrighted material

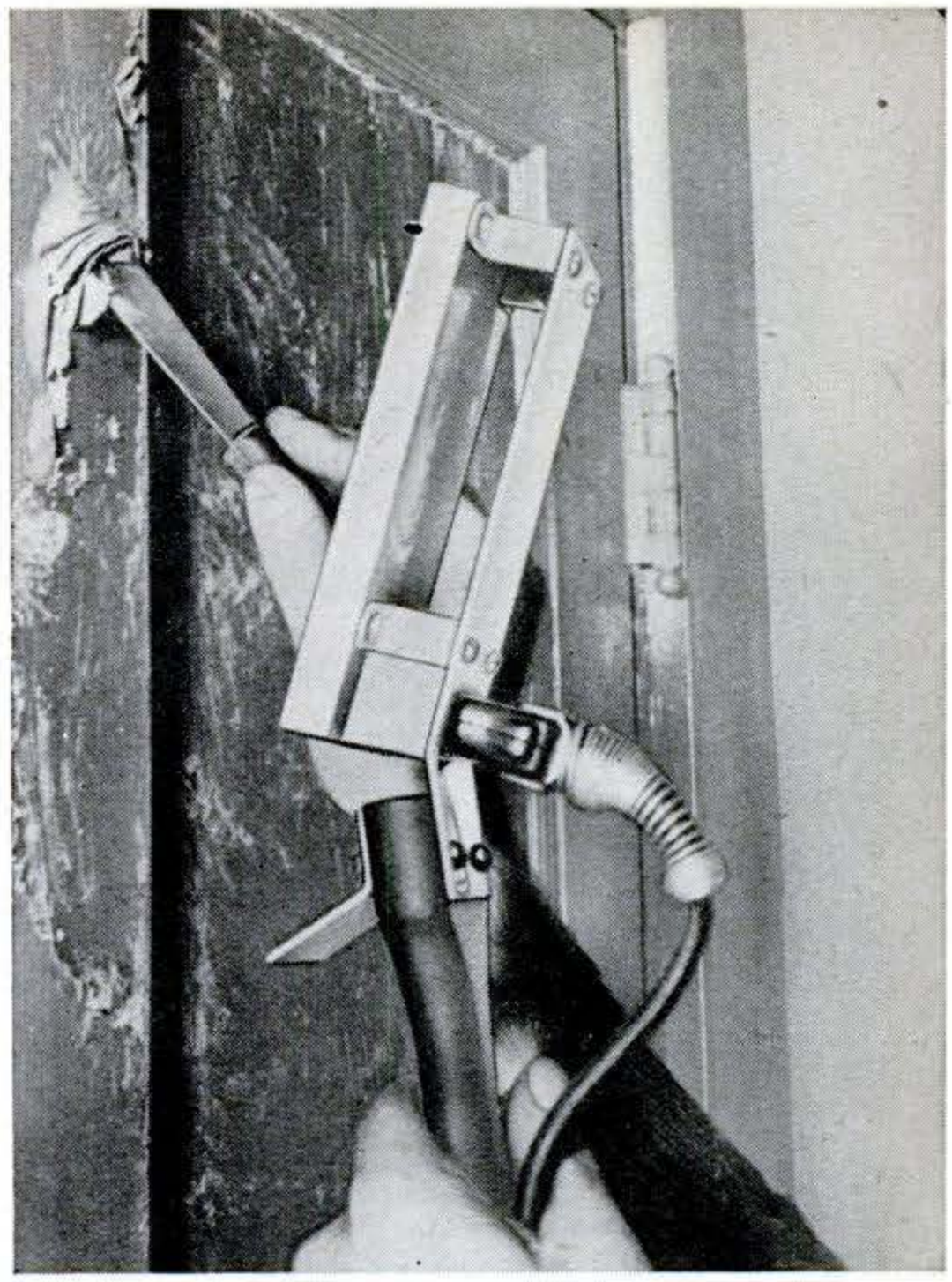
New Tools



Hold-Down for Jointers. The roller system of this attachment holds stock against the jointer fence and table without effort by the tool operator. After the work is started under the first roller, a push stick is used to feed the work. The rollers, slightly toed in, track the stock snugly against the fence and also keep it planing flat and accurately. *Duro Metal Products Co., Chicago.*

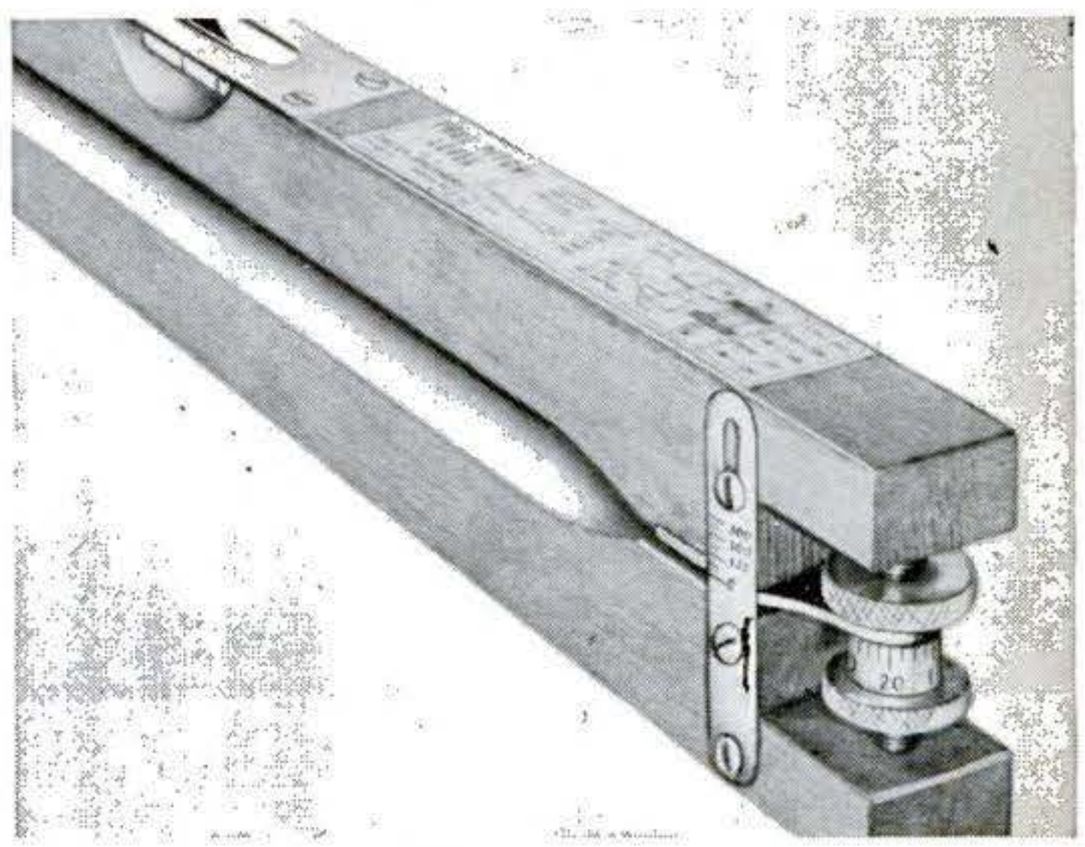
Dresser for Grinding Wheels. Boron carbide—the hardest substance known, except for the diamond—is used as the point of this tool. The boron carbide insert is held in a 5″ aluminum handle. The tool can dress medium-hardness grinding wheels that are 10″ or less in diameter. *Robert Marks Co., Providence, R. I.*





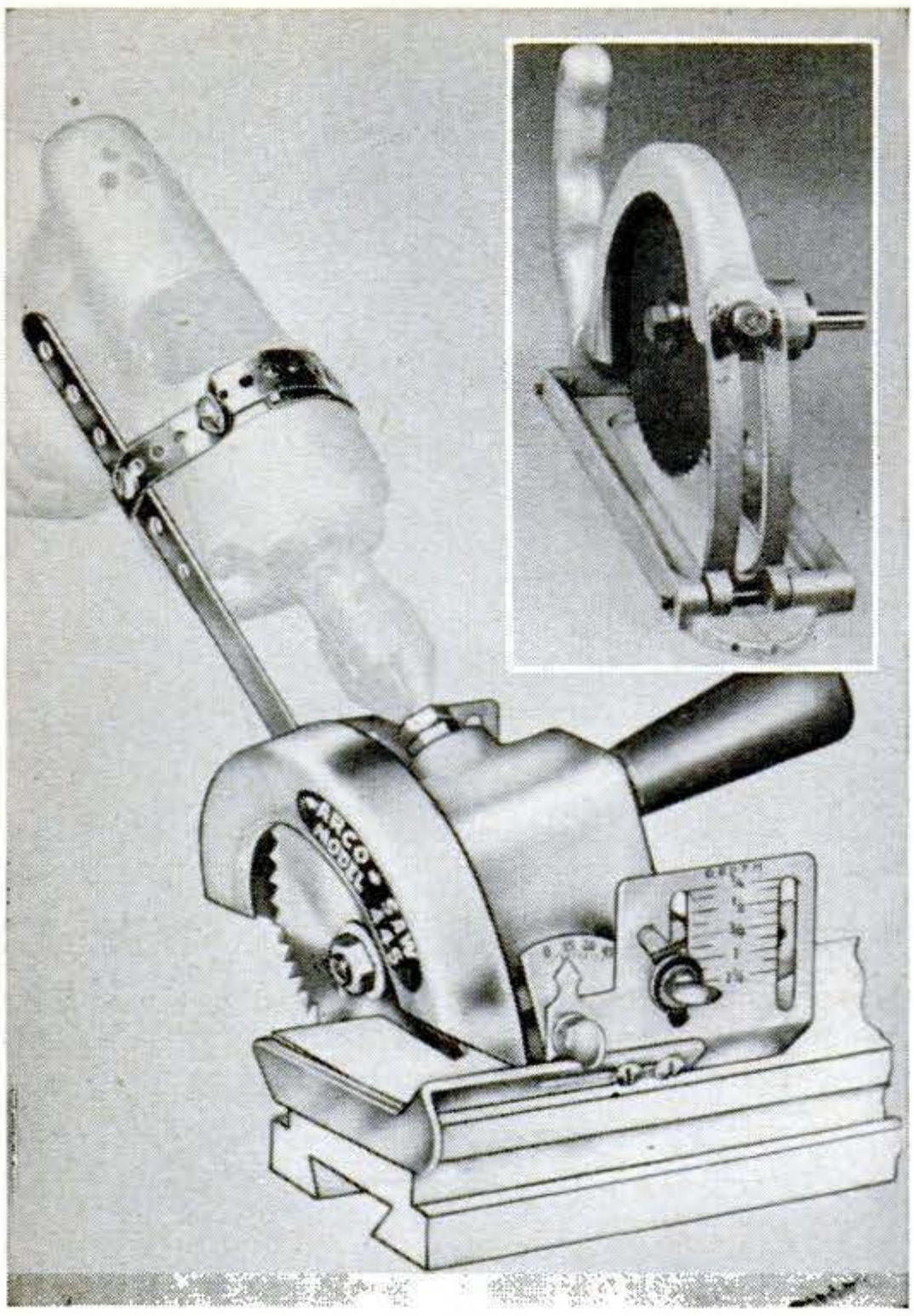
Removes Paint, Wallpaper, Putty. You also can use this tool in laying asphalt tile. It heats to its operating temperature, near 1,000° F., in about three minutes on AC or DC. *B & L Tool and Machine Co., Plainville, Conn.*

Level Sets Pipe Pitch. The angular adjustment on this 20½″ level helps you set pipes and drains to the pitch you want. In use, the gauge is turned to the desired pitch and the level is placed on the pipe. When the pipe has that pitch, the bubble will center. To get the pitch, divide the total fall by the length of the run. That figure is set on the adjustment at one end of the level. The other end is hinged. Set to zero, tool is an ordinary level. *Dreier Bros., Chicago.*

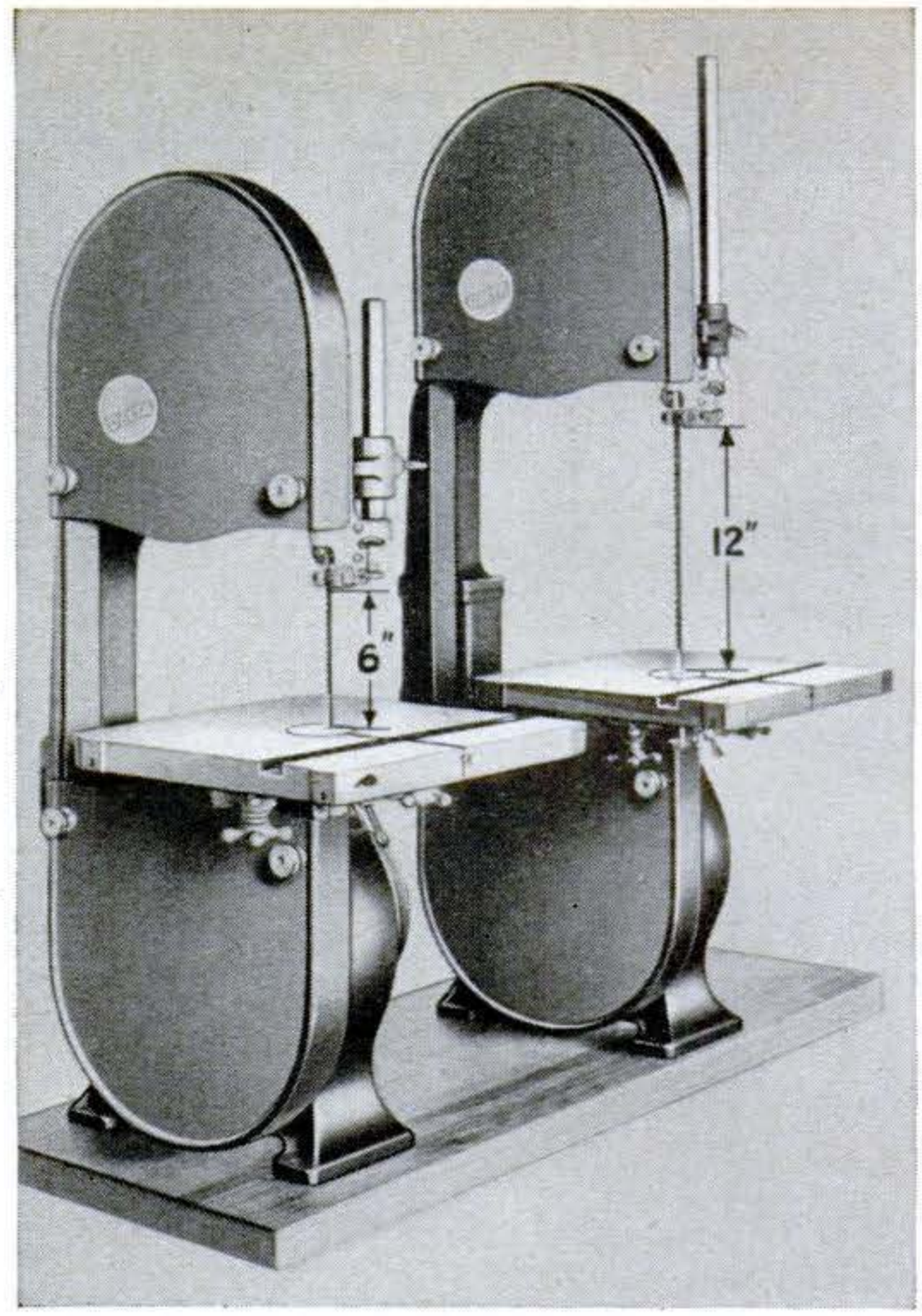


Please turn the page for more new tools.

Copyrighted material



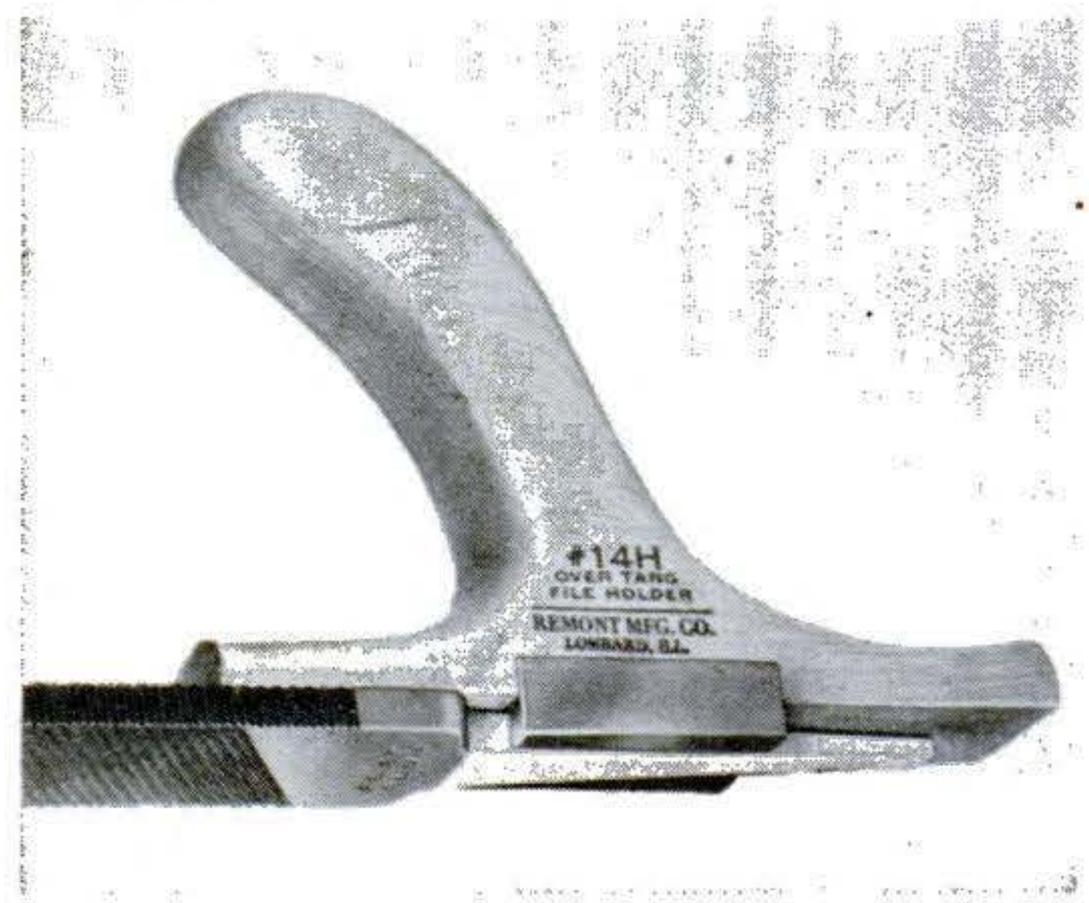
Saw Attachments Cut Miters. Both of these attachments for electric drills can be set to saw bevels up to 45°. Besides the bevel gauge, the one in the larger photo above—made by Arrow Metal Products Co., New York City—has rip and depth gauges. The other (insert) is marketed by Cardinal Creations Corp., Long Island City, N. Y.



Attachment Enlarges Bandsaw. Delta bandsaws with a 6″ capacity can be stepped up to 12″ by use of that company's height attachment (right above). It consists of a cast-iron raising block and the necessary fittings. A longer hexagonal guide post is included. *Delta Power Tool Division, Rockwell Manufacturing Co., Milwaukee.*

Power-Tool Kit for Home Use. Included are a 6″ sander-polisher that can be used as a ¼″ electric drill, seven twist drills, a 3″ grinding wheel, bench stand, hex key, chuck, sanding disks, lamb's-wool bonnet and a steel carrying case. *Skilsaw, Inc., Chicago.*

Handle for Files. This handle provides a comfortable grip above a file, leaving the entire cutting surface of the file unobstructed. The file is mounted by driving the tang in the steel V block under the wooden handle. *Remont Manufacturing Co., Lombard, Ill.*



Copyrighted material

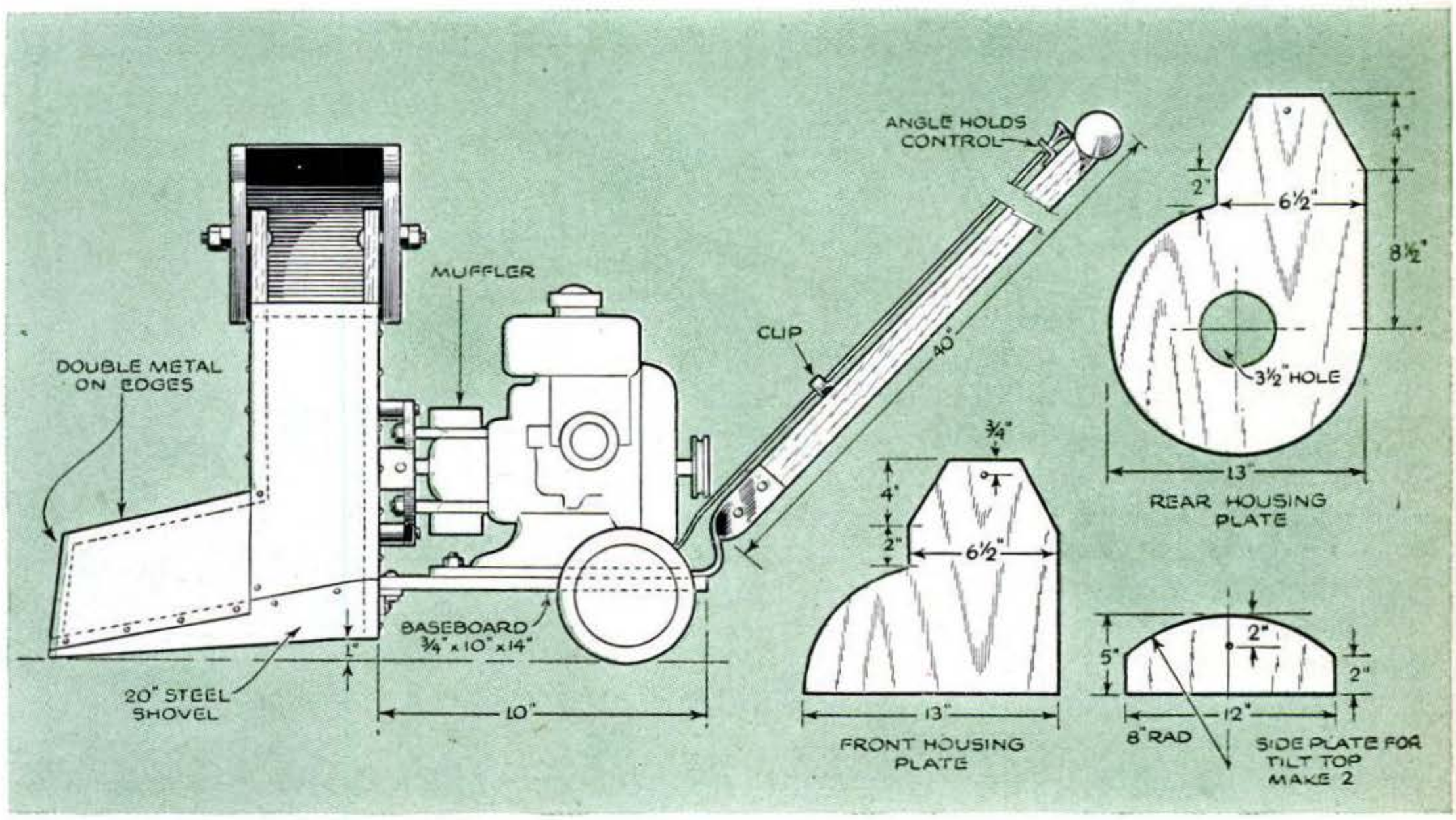
I Shovel Snow with a Lawn-Mower Engine

Blizzards needn't mean backaches if you hitch gasoline, instead of your sacroiliac, to the snow shovel.

By Howard G. McEntee

THOSE big rotary plows clear snow from the highways with impressive ease. My midget works on the same principle. It's not meant for Minnesota drifts, but it can handle snowfalls under 6″ deep and will even take care of heavier storms if you don't mind running it back and forth during the storm.

Building the plow gave me a chance to use a lawn-mower engine that would otherwise be standing idle. Now, before cold weather arrives, I simply transfer the engine



Copyrighted material

—a 1.2-hp., two-cycle job—from mower to plow.

When a storm comes, I roll the plow along my walk and driveway, scooping up the snow while the engine drives a whirling rotor, throwing the snow up and to one side by centrifugal action.

Materials used. Wood parts were all cut from ½″ exterior (weatherproof) plywood except the baseboard. Here, I used the ¾″ size for additional strength. The rest of the housing is sheet metal, with some angle iron to join or reinforce various parts.

For the scoop that is pushed into the snow, I chose a heavy old steel snow shovel. This is better than an aluminum one, since the steel is stronger.

Making the scoop. I kept the steel edging and underneath braces of the shovel to maintain stiffness. The back edge was cut and bent to fit around the wood housing plate. The shovel should be nearly level, just enough incline so it clears the sidewalk at the rear when the wheels are in place. Two wings or cheek pieces join the scoop and housing rim.

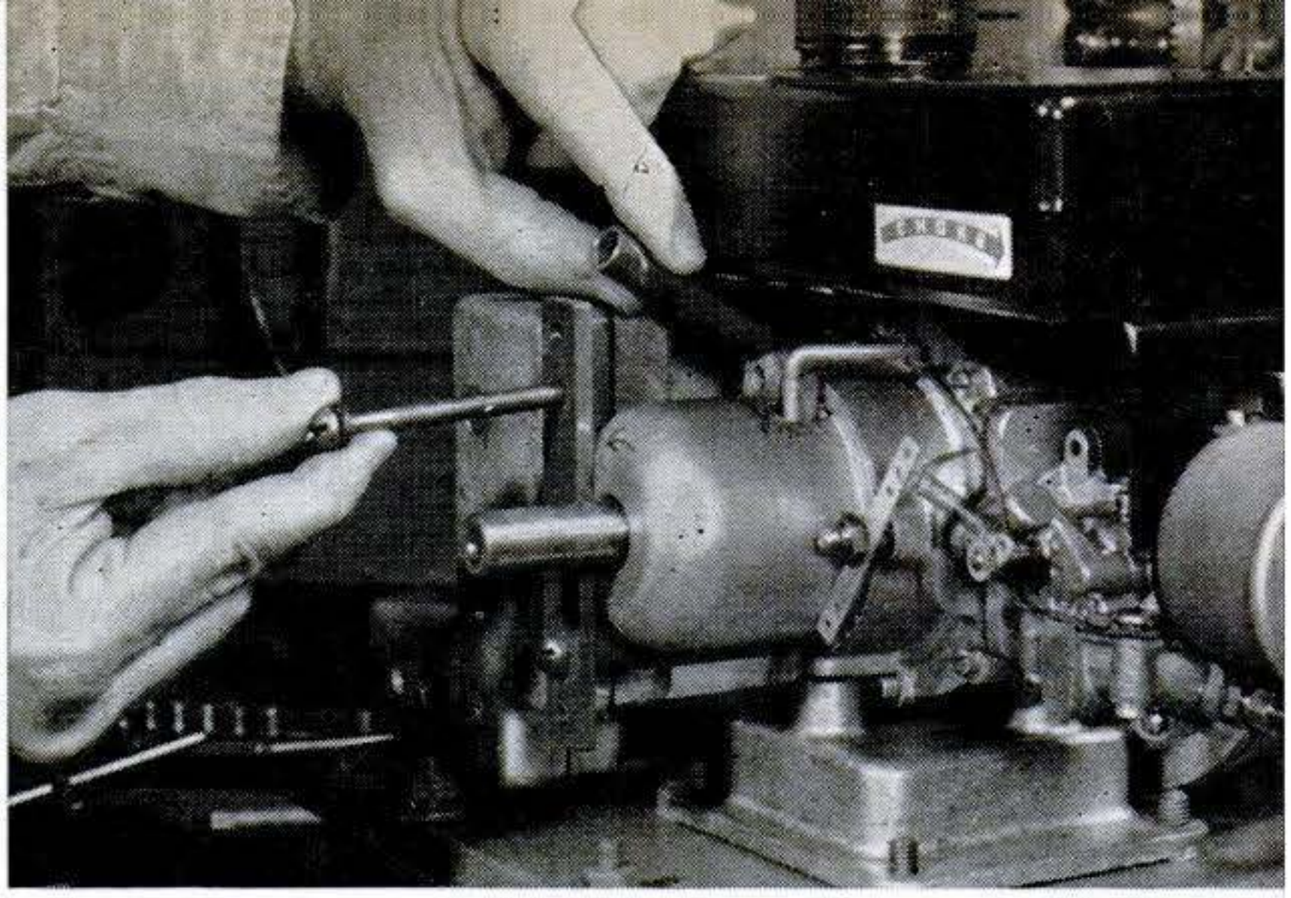
Roundhead wood screws hold the metal to the plywood plates. I made the many sheet-metal holes required with a hand punch, which is much faster than drilling. I used washers wherever nuts or bolts bear against the wood.

The rotor. Mounted on the motor shaft, the rotor required careful construction and exact balancing. An unbalanced rotor could shake the plow to pieces.

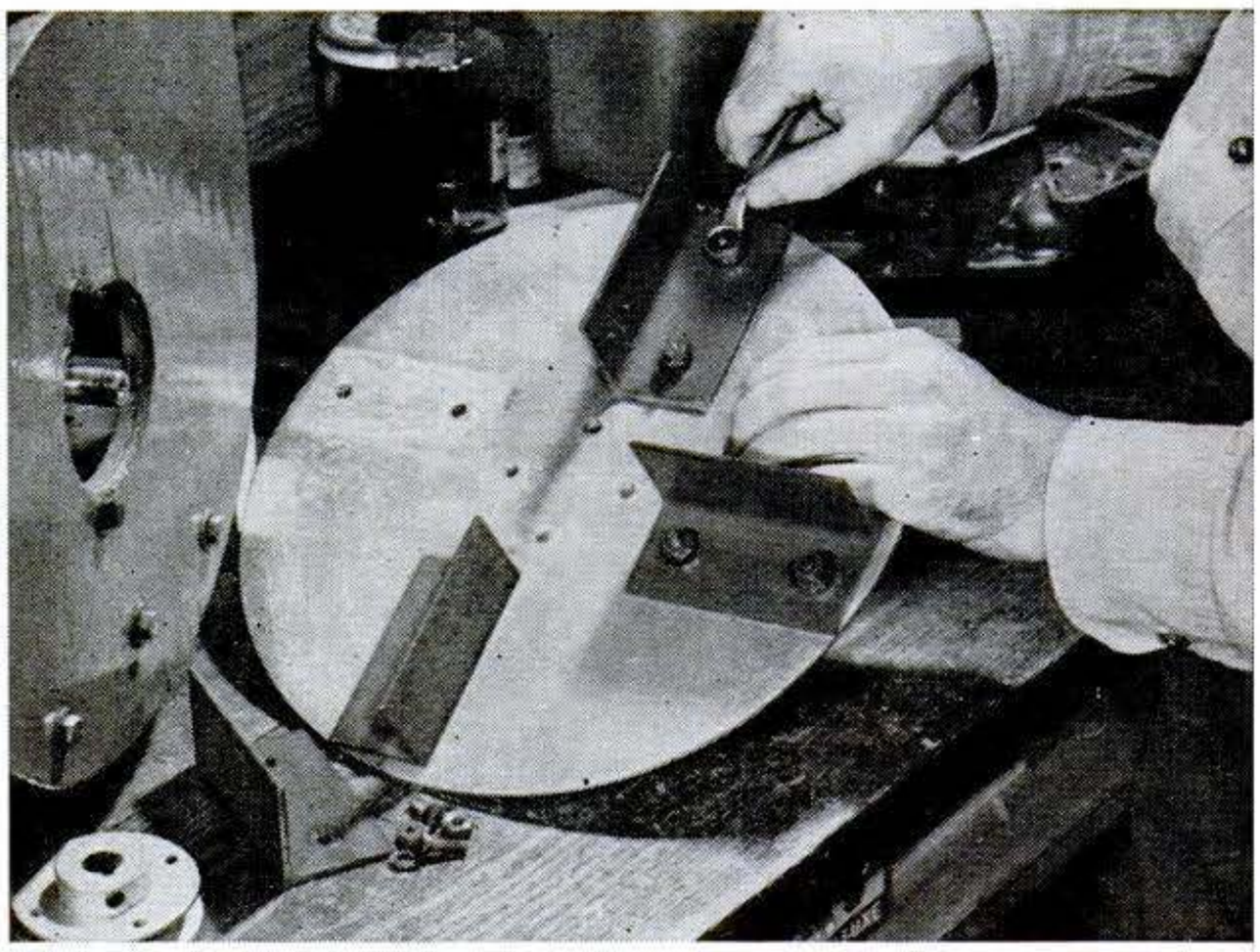
But balancing isn't difficult. During the course of building and changing designs, I had to rebalance the rotor several times. Smooth running showed I hit it well each time. Lock washers secure all nuts used in assembly.

Final details. Express-wagon wheels of 6½″ diameter were used. Wheels with fatter tires would be better, for mine tend to stick in ruts. The handle came from an old lawn mower, as did the strap-iron pieces that hold it. These were heated dull red with a gasoline blowtorch, then twisted and hammered to the desired shape.

An auto choke wire, linked to the pivoted arm, controls the throttle. Radio spaghetti was slipped over the wire to protect it from moisture. Actually, the centrifugal governor controls the throttle, and the hand control limits governor action. The governor helps keep engine speed steady when the plow is pushed through snow.



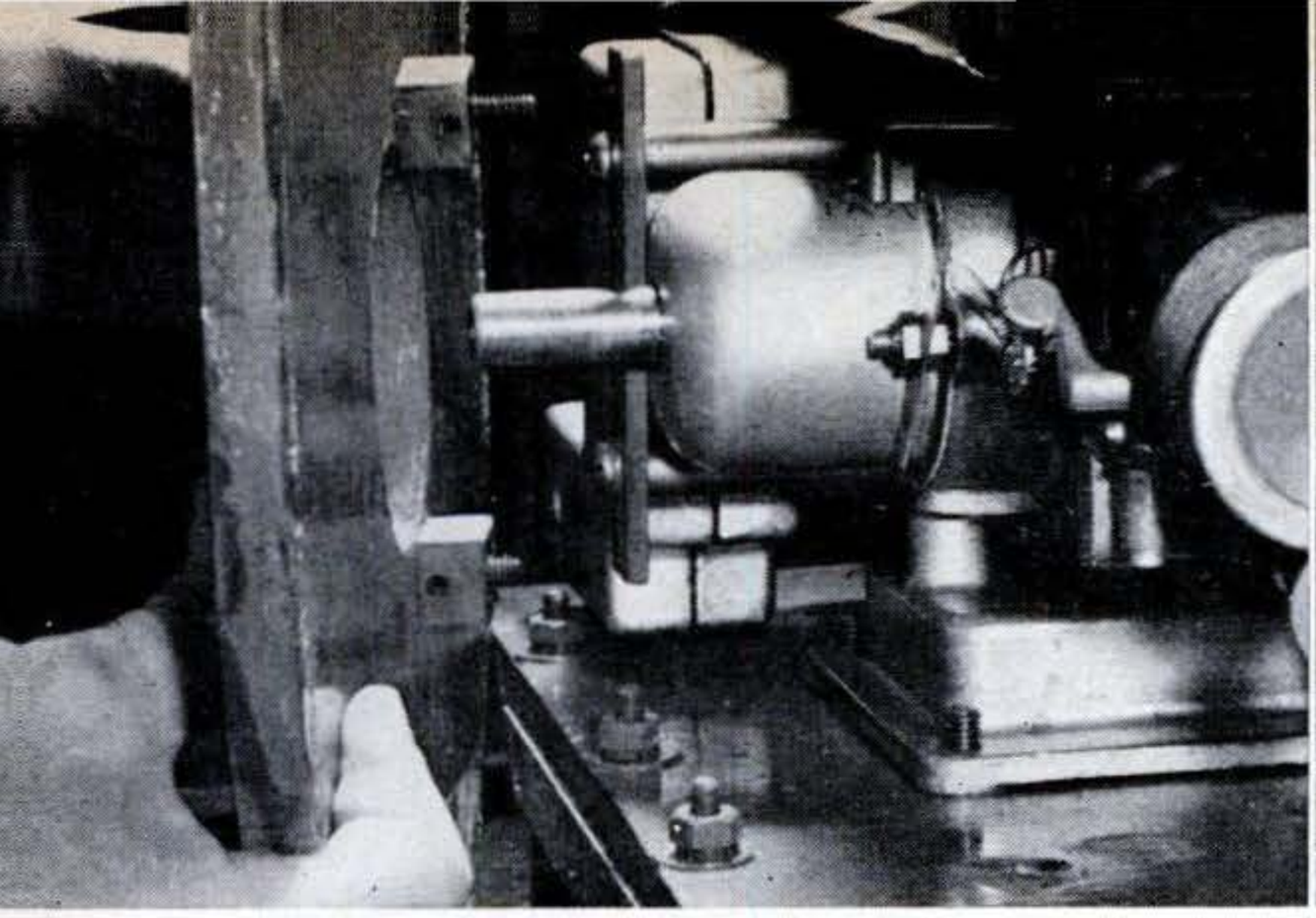
1 Engine was mounted with shaft projecting beyond one side of ¾″ by 10″ by 14″ baseboard, bolts holding it in place. To support rotor housing, a piece of strap iron was attached to governor-shell boltholes. Two long screws and pipe spacers hold it alongside shaft.



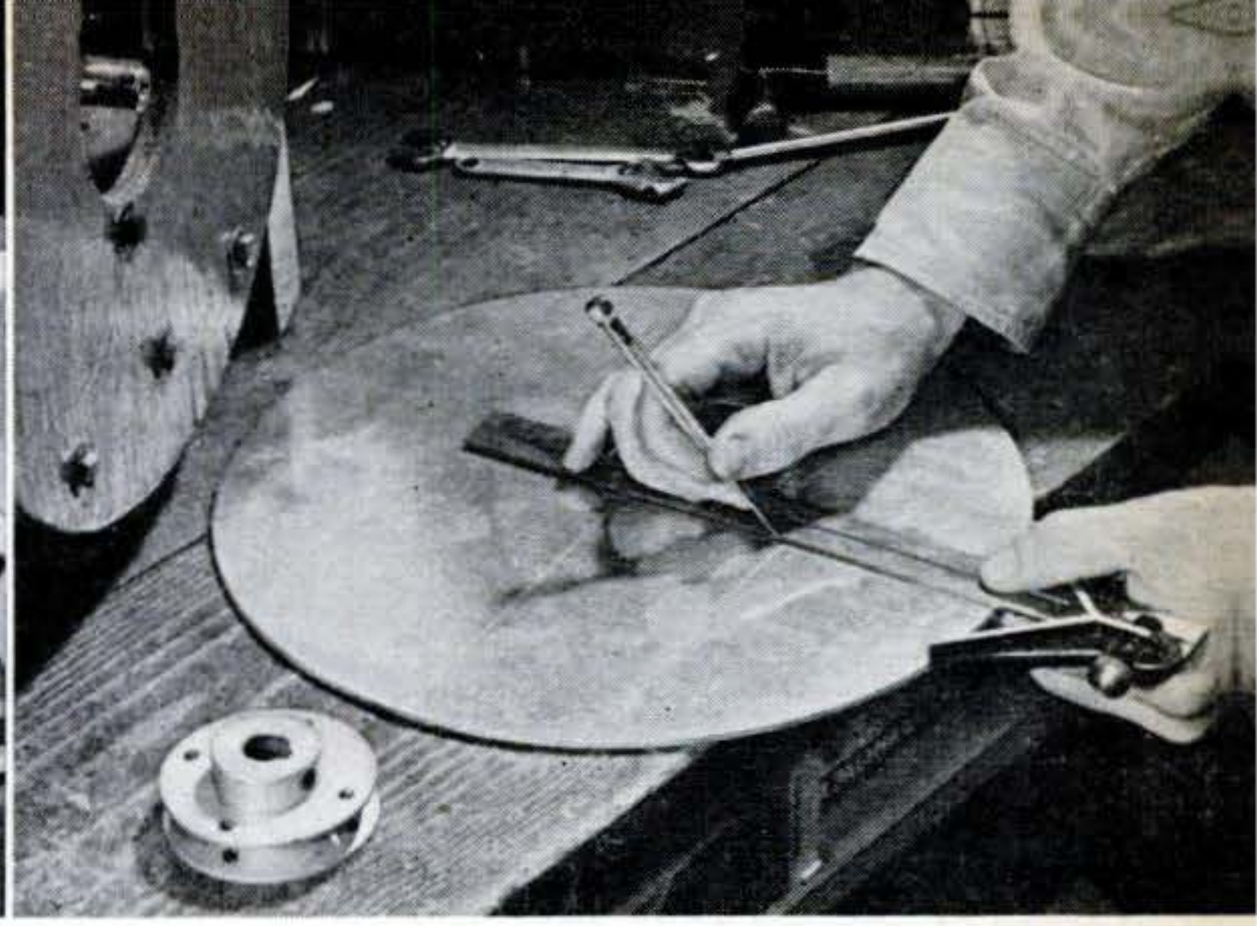
4 Rotor blades, 3½″ matched lengths of ⅛″ by 1½″ by 1½″ angle iron, are mounted with ¼″-20 bolts. Blades are spaced 90° apart with vertical flanges radial to center of disk and the ends all equidistant from disk edge. Hub must be carefully centered for good balance.

7 Front edges of housing sides were bent over and punched for bolts that secure front plywood plate (here held in hands). This piece has a length of angle stock bolted to bottom edge for reinforcement. Iron takes shock of small ice chunks, prevents damage to wood.

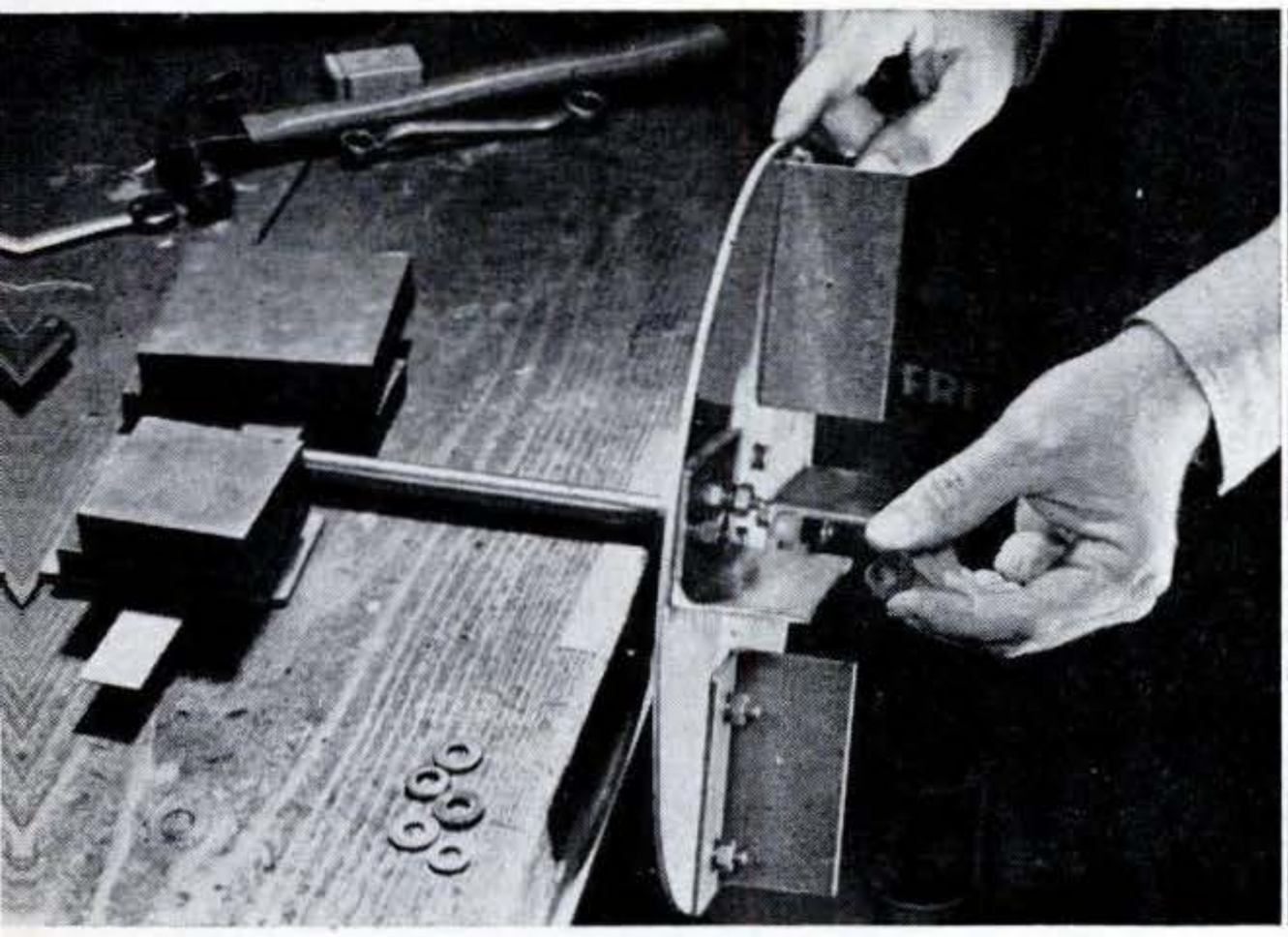
Copyrighted material



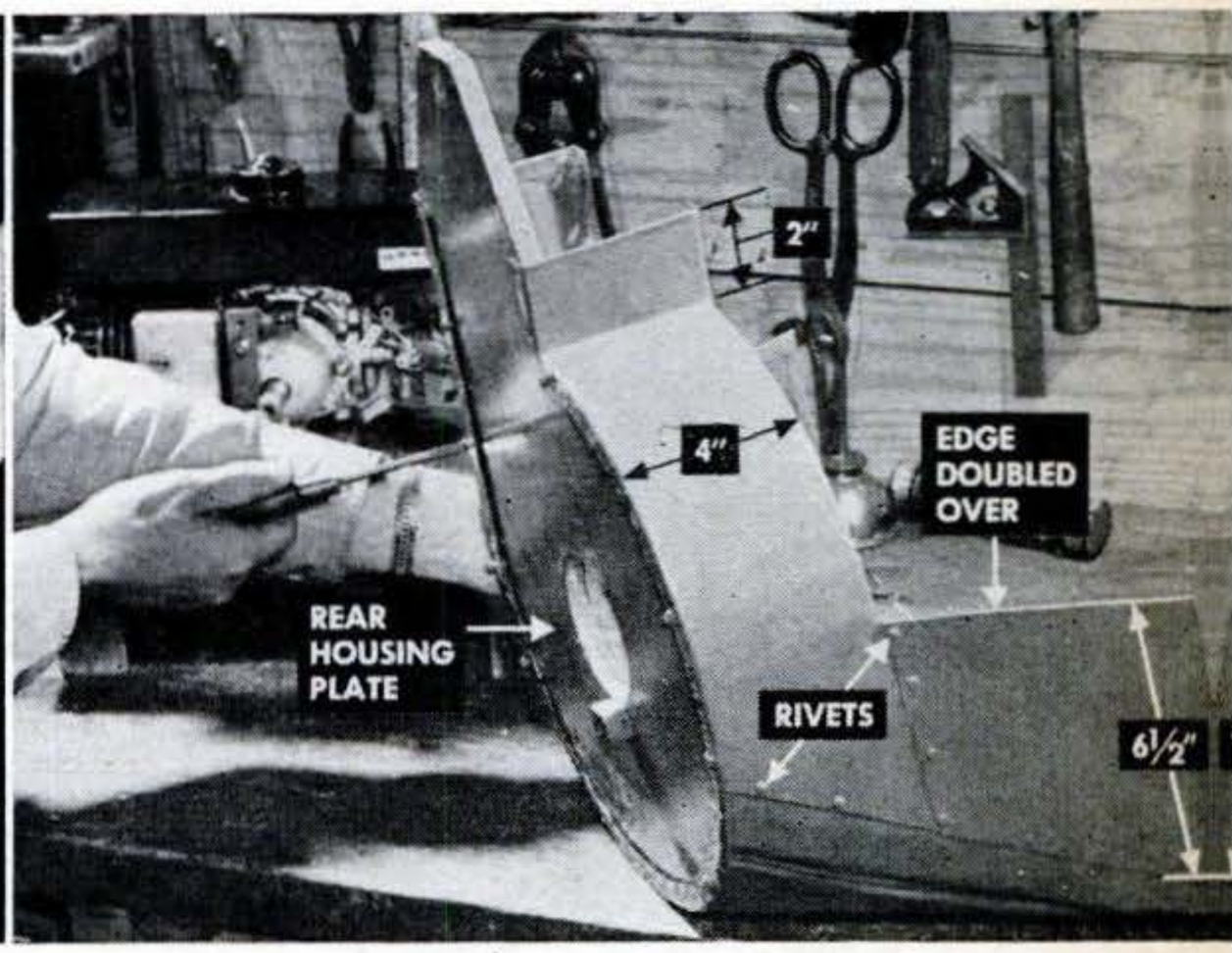
2 Back plate of rotor housing, cut to shape shown in drawing, was then fastened to strap iron. Two ¼"-20 screws, run through plate and wood spacing blocks, were turned into holes tapped in strap ends. Plate was also bolted to angle iron bolted under base.



3 Rotor consists of 12½" disk cut from ⅛" aluminum, a 3" cast-iron V pulley (used as a hub) and four heavy angle-iron blades. Here, disk center is being found with combination square. I avoided a die-cast pulley for hub; it might fly apart under centrifugal force.



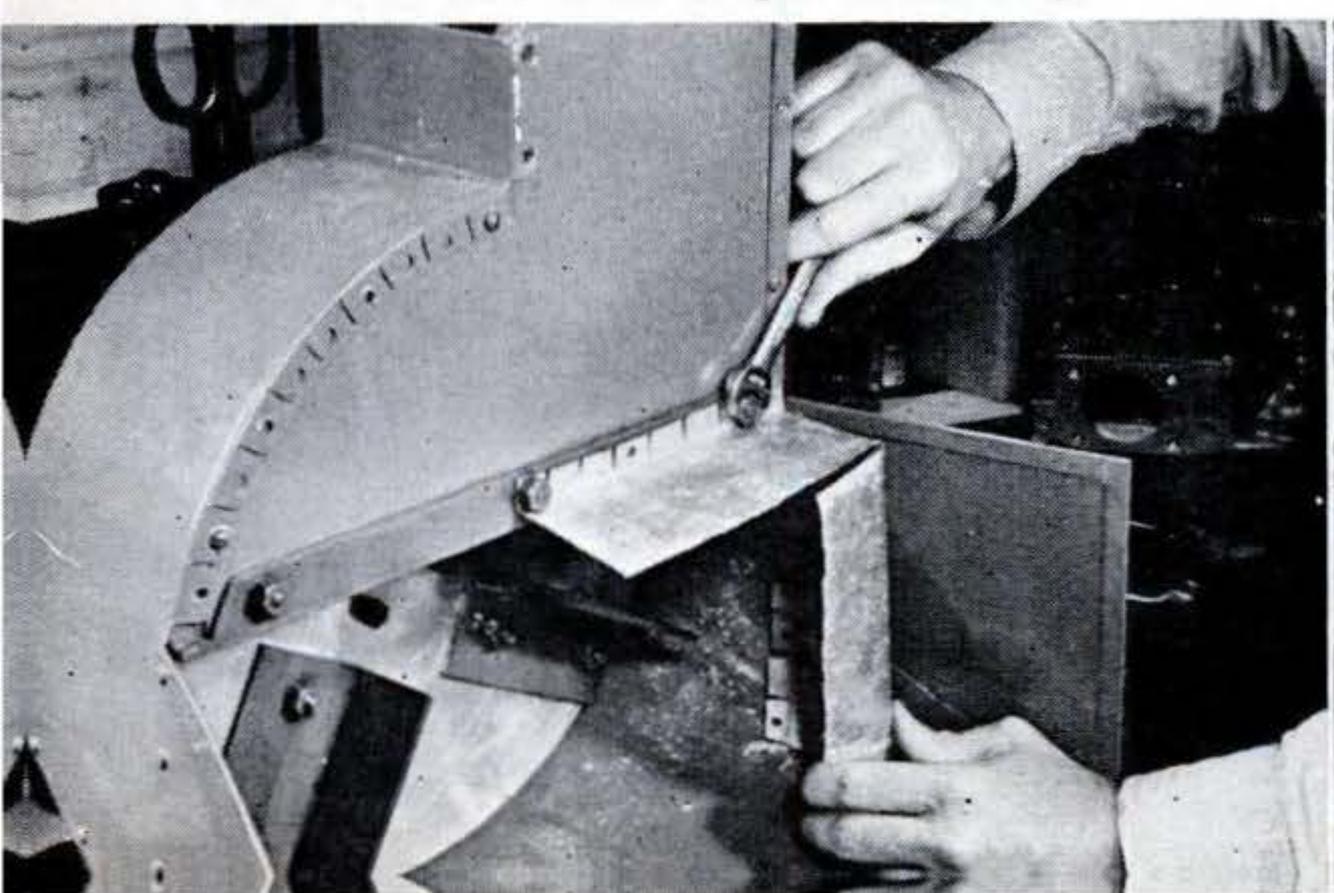
5 Balancing the rotor. Rest a ⅝" shaft on steel rule at edge of bench; weight down second rule over end of shaft. Slip washers on bolts until rotor stops at different place every time you spin it. Then take off nuts and clamp washers on.

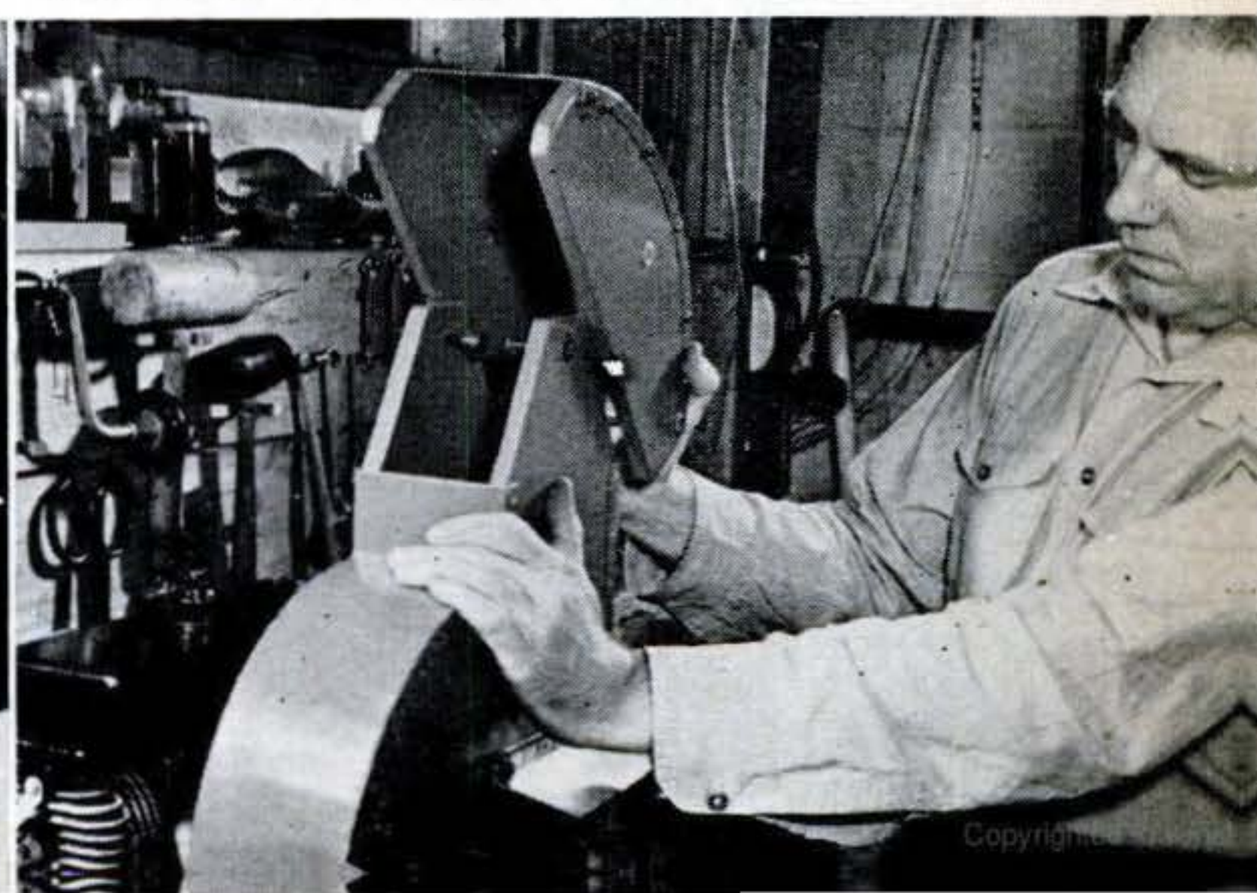


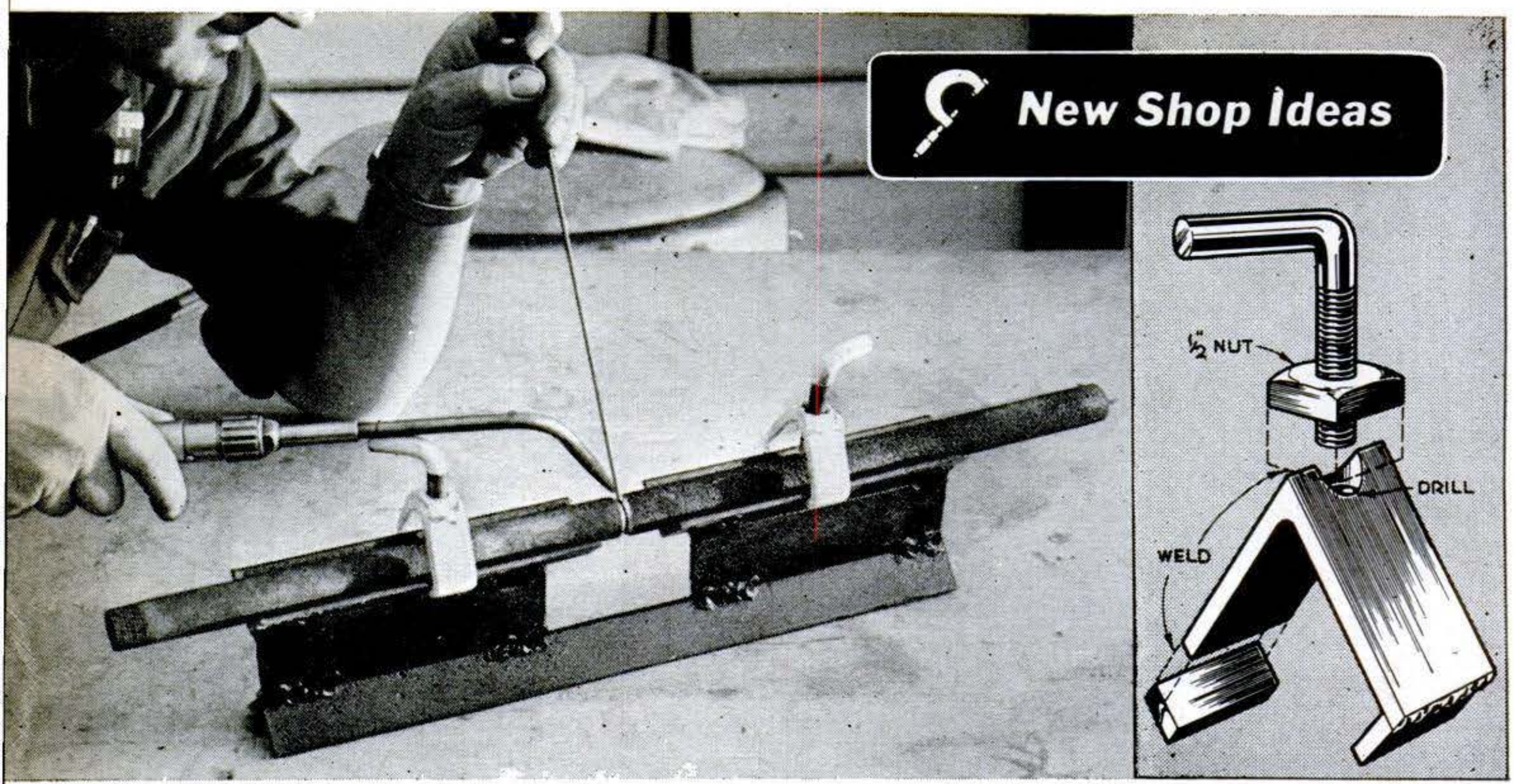
6 Making the scoop. Rear housing plate was removed to attach scoop and housing sides. Steel snow shovel was bent at rear to conform to housing curve. Tabs cut in edge were bent over and fastened to plate with wood screws. Wings were riveted to scoop sides, housing rim.

8 Sheet-metal shield mounted like this was my solution when counterclockwise rotation of blades threw some snow out of scoop instead of up stack. Later experience has shown it may be best to omit front vertical flange of shield. Shield is bent from single metal strip.

9 Tilting top, made of two pieces of plywood with curved sheet-metal hood joining them, pivots on two bolts set into stack. Bolts are drawn up just tight enough to hold, so I can swing the top and direct stream of snow to whichever side happens to be best. END





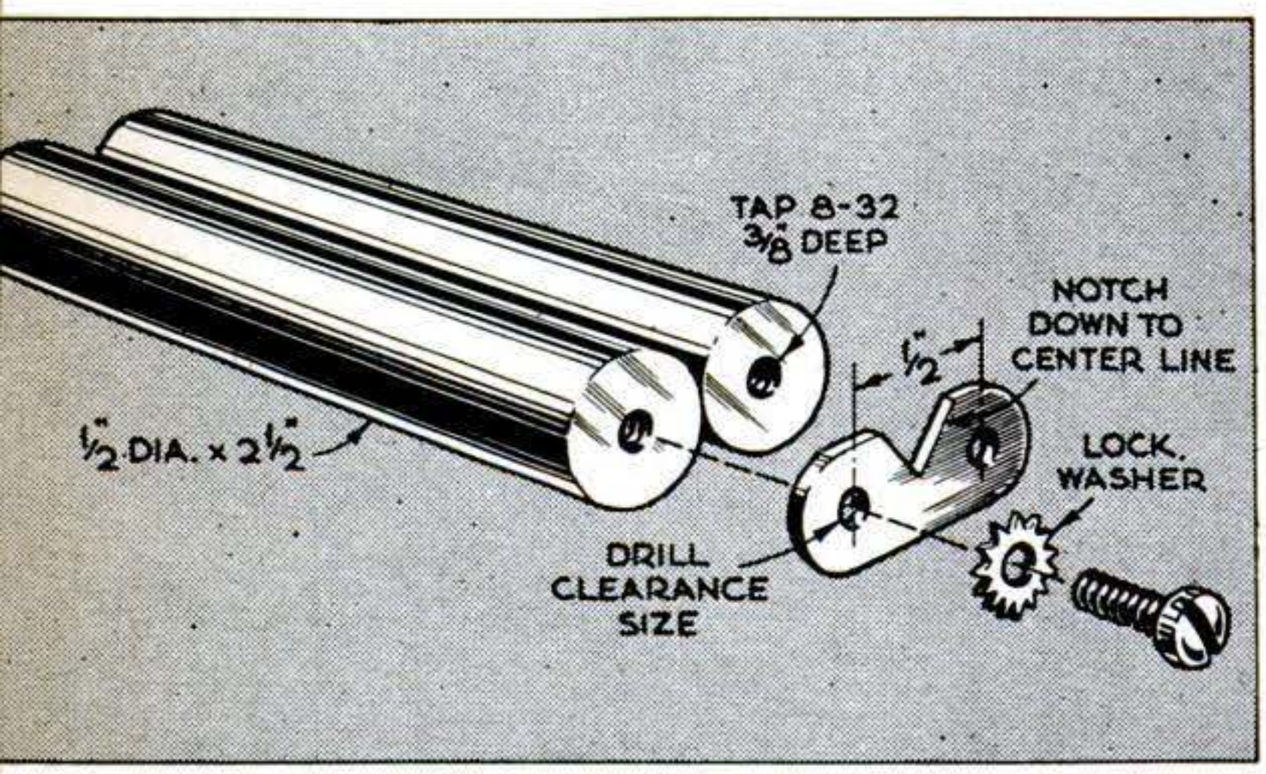


Welding Butted Ends. A jig for welding rods, pipe, and bar or angle stock end to end is itself a simple welding job. It holds two pieces of the same size in perfect alignment and permits welding entirely around them.

Weld two pieces of 2″-wide flat stock on top of a length of angle iron, leaving 4″ between them. Make two clamps by welding nuts to short sections of large angle and adding small pieces to the ends as in the drawing. Cut the heads off two bolts and bend the shanks into handles.

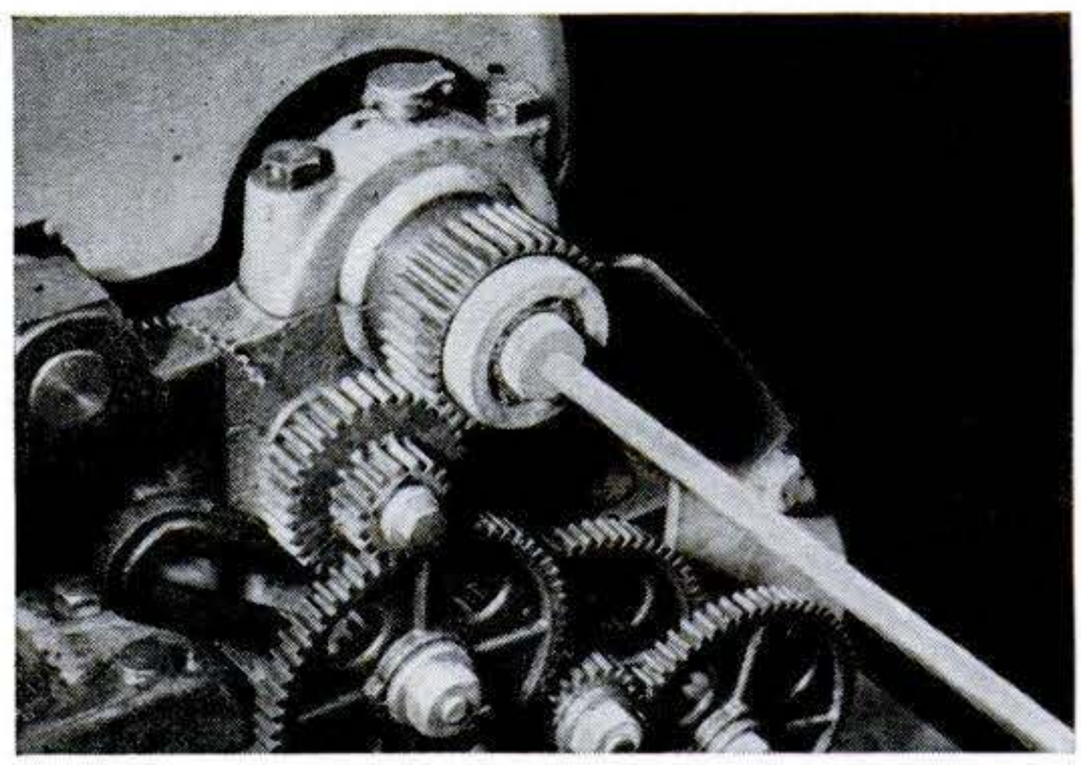
With the clamps, secure two lengths of angle iron to a piece of shafting or pipe to align them, leaving a gap of 2″ between the ends. Then weld the clamped angles to the top edges of the flat pieces.

To hold two rounds of unequal diameter concentric, bush or shim up the smaller one. —*Herman Adolf, Richmond, Calif.*



V Block Is Renewable. Costing little to make, this V block can be renewed as it wears simply by turning the round bars to expose new working surfaces.

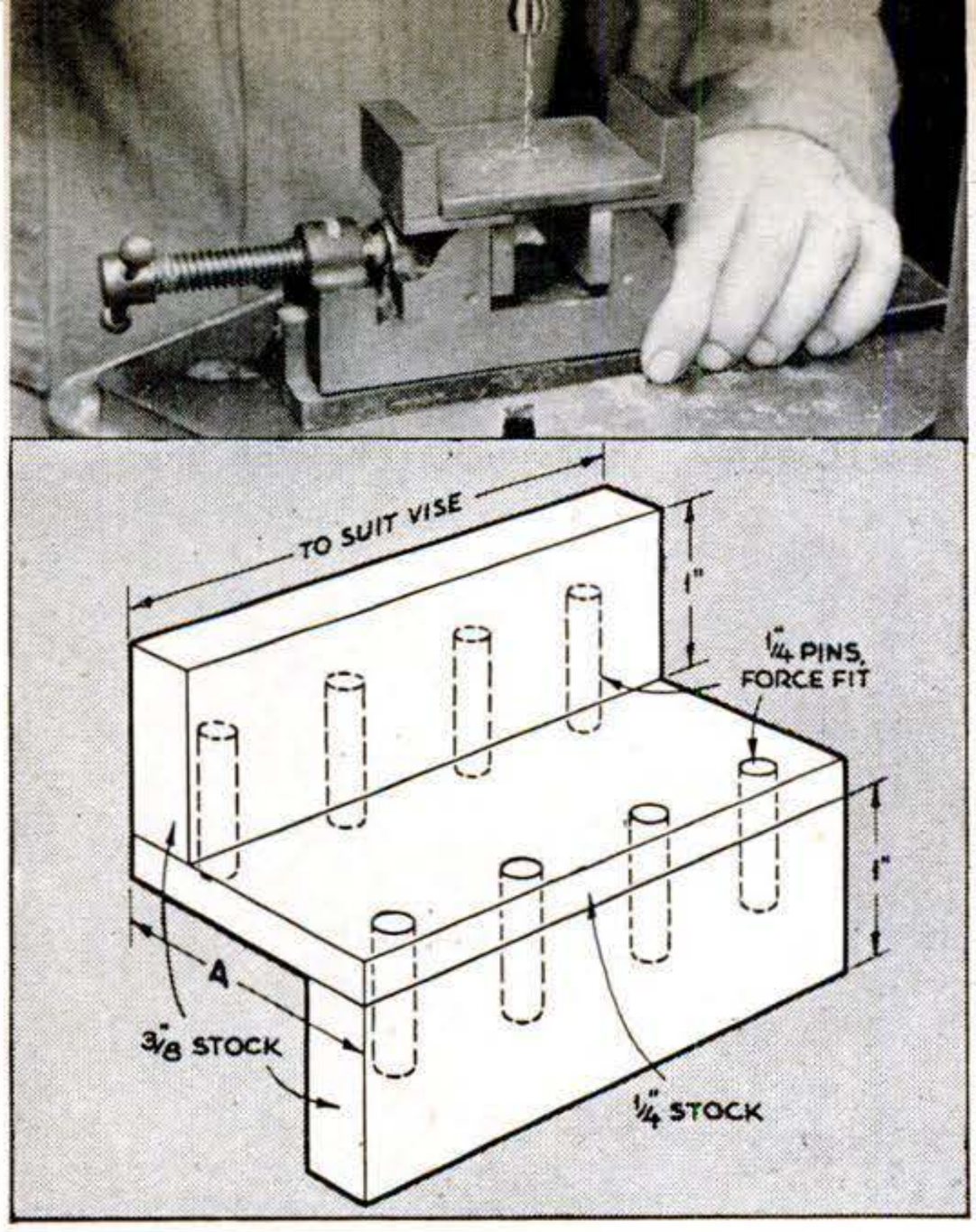
Face the ends of two pieces of bar stock to equal length, centerdrill, and tap 8-32 to ⅜″ depth. Cut two end links from 1/16″ or ⅛″ flat stock. Clamp them together and drill through both at once, spacing the holes just the diameter of the bars apart. Assemble with the bars held down on a flat, true surface.—*Harry D. Cousins, Chicago.*



Bushing Stops Whip. It's risky to let a rod extending through the lathe spindle whip around. Besides putting a heavy load on the chuck, it may bend and flail about dangerously.

To play safe, find a bit of dowel or a wooden plug that's a light drive fit in the end of the spindle. Chuck it and drill through a close fit for the rod to be turned. Tap the resulting bushing into the spindle. If it's a trifle loose, wrap it with paper first.—*Will Thomas, Buffalo.*

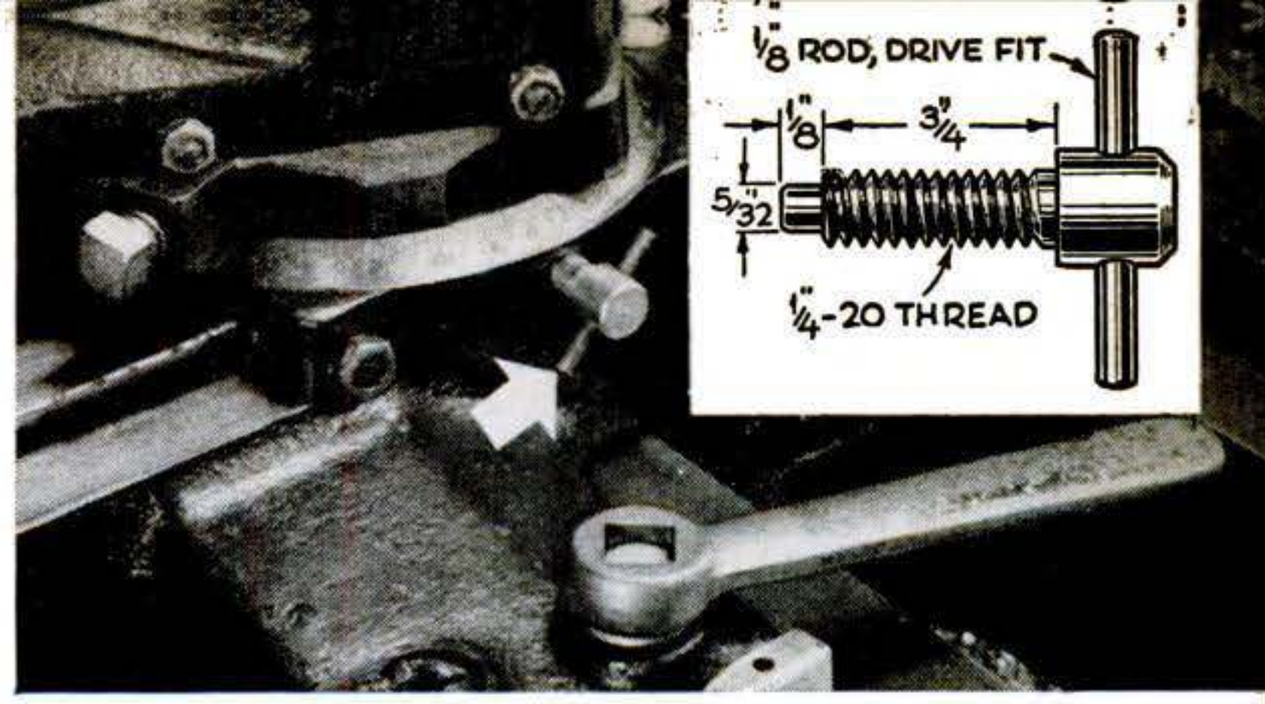
Copyrighted material



Enlarging Machine Vise. Sometimes you bite off more of a job than your drill-press or milling-machine vise will chew. Instead of fussing with blocks and hold-downs, make these extension jaws to take over where normal vise capacity leaves off.

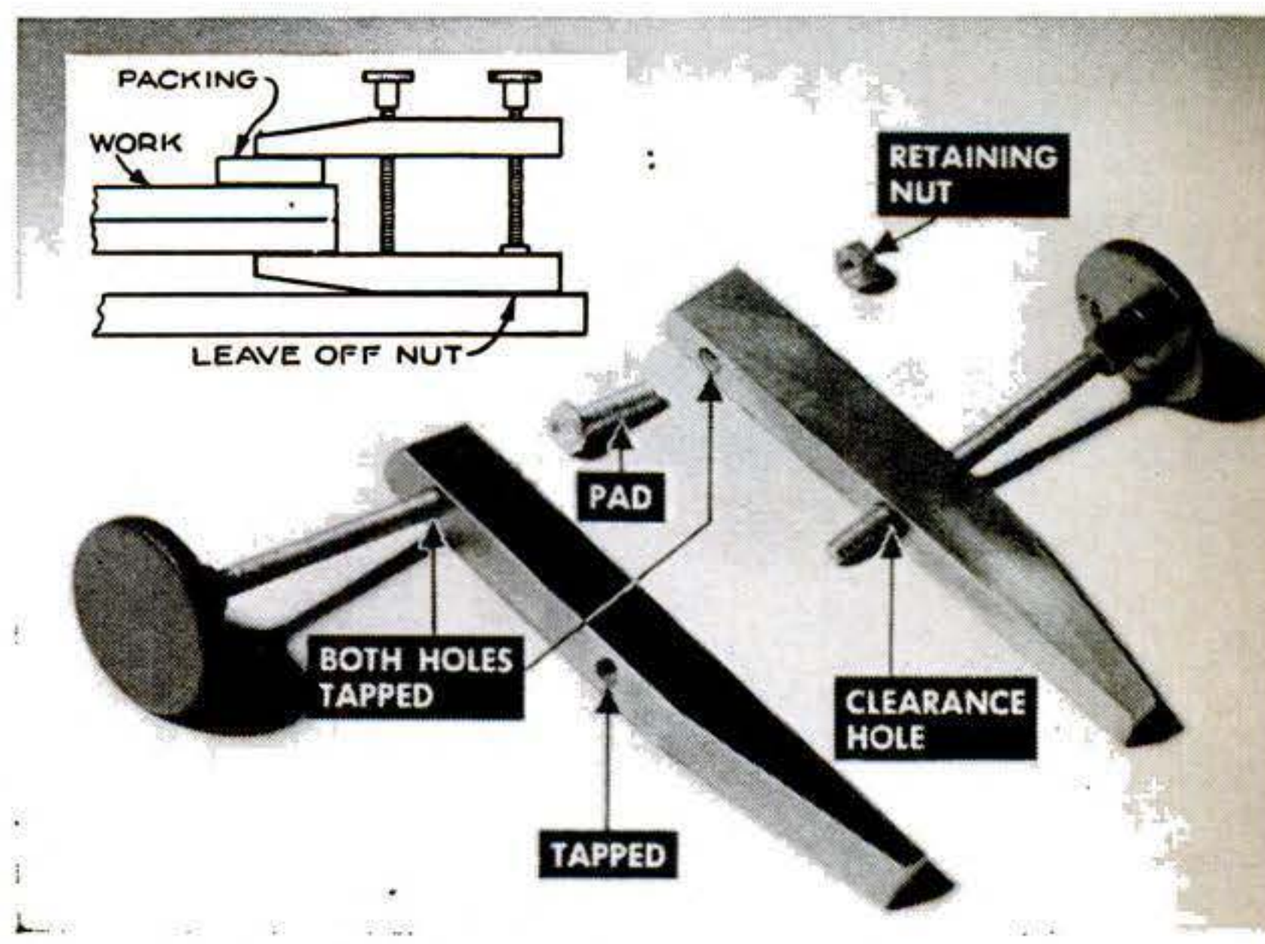
Cut six pieces as long as the vise is wide, but make the width *A* in the drawing such that, when the vise is closed, the extension jaws will have the same capacity as the vise alone has wide open. This gives you an uninterrupted size range. Drill the pin holes for a solid force fit.

Such jaws will hold flat or square pieces for normal machining, but aren't recommended for heavy milling or shaping, or for odd-shaped work.



Quick Gib Adjustment. After adjusting the lathe cross slide to move without play, you may have to lock up the gibs for milling or some other job requiring a rigid setup. To avoid such frequent readjustment, replace one setscrew with a T bolt.

You can turn and thread one from stock, or shoulder down a cap screw. Drive in a bit of rod as a handle. Set the other screws for cross-slide travel, making any tighter adjustment with the T bolt alone.—*Harry L. Truchelut, Atlanta.*

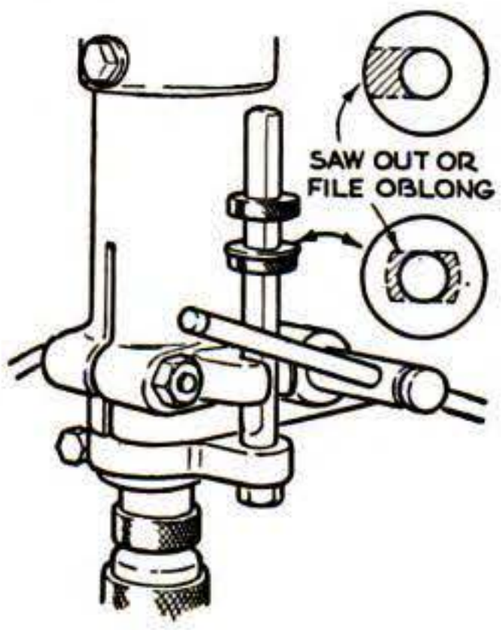


Clamp Works Two Ways. By tapping through where the outer screw of a parallel clamp bears, you can use both screws in one jaw. Clamped work can then be held on a machine table without the screw getting in the way. If the through screw protrudes, substitute a shorter one or insert packing.

For maximum convenience, alter at least two clamps. Drill through and tap the hole. Make a pad, from a bolt small enough to slip into the hole, for the screw to bear against. Retain it with a nut.

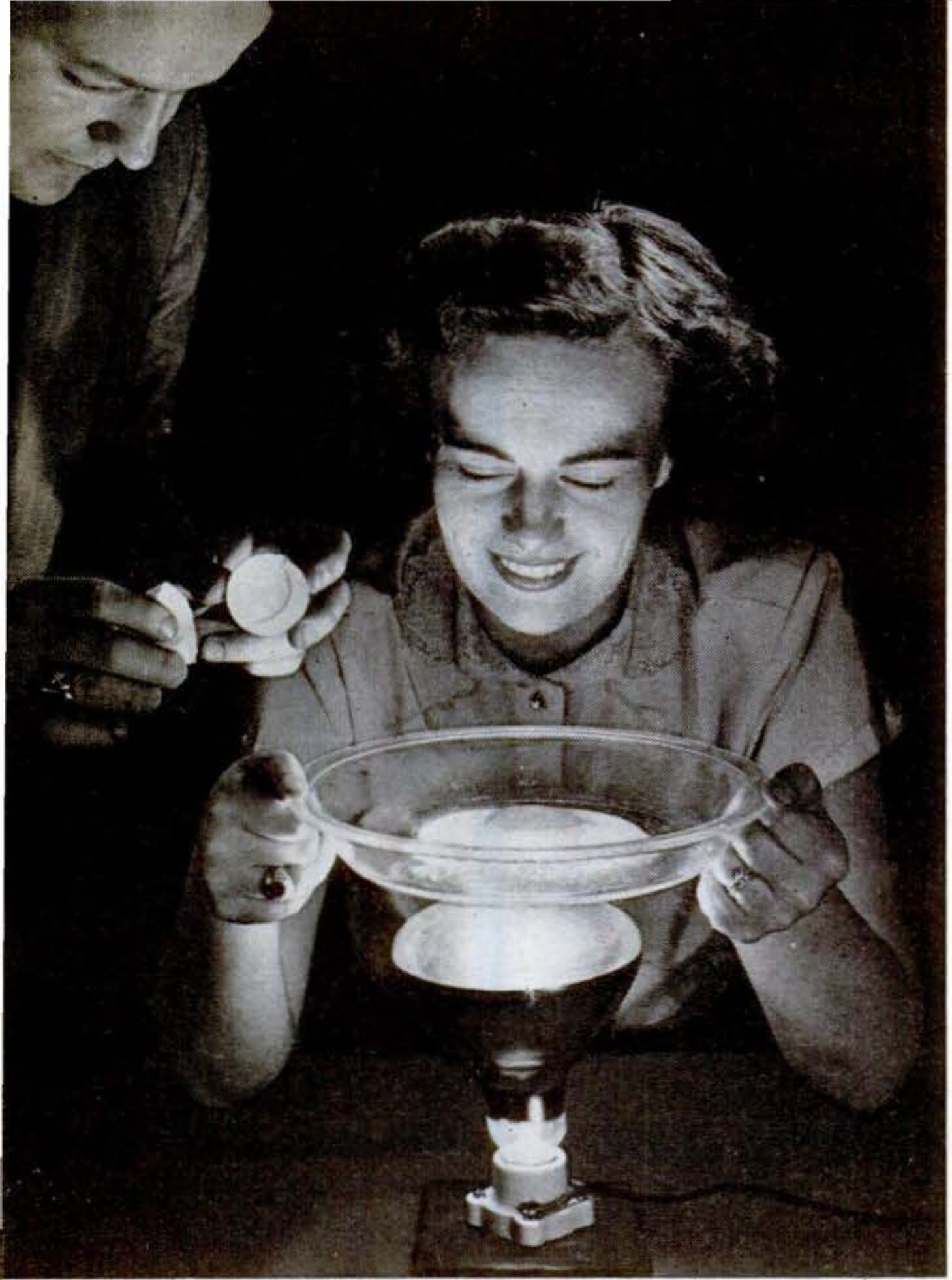
The clamp shown is fitted with 1¼" knurled knobs that will hold most jobs when turned finger tight, eliminating the need for a rod. Turn knobs from bar stock, tap, thread them on, and pin.—*Floyd McGuckin, Ridgewood, N. J.*

One-Hand Depth Setting. A keyed washer between the stop nuts on a drill-press depth gauge saves time in making frequent depth adjustments. With such a washer, the lower nut will stay put and not turn while the lock nut is tightened on it. The adjustment can therefore be made with one hand while the other is occupied.



Simply alter an ordinary washer as shown in the drawing. File the opening to a slip fit over the flats on the threaded rod.—*Fred Lettino, Astoria, N. Y.*

Copyrighted material



FRYING EGGS You can hold a glass pie plate in your hands while an egg fries in it. Radiant heat goes through the glass, scarcely warming it. The egg, more opaque to infrared rays, absorbs heat and is cooked. Radiant heat dries thin paint films from the inside out because, like the egg, they are semi-opaque to these heat waves.

BLACK LENS What's opaque to light may be transparent to infrared rays. If you fill a 300-milliliter chemical flask like this one with water, it will focus the beam of a heat lamp into a bright spot, but the spot will be hardly warm. The water passes light, but in this thickness absorbs most of the infrared wave lengths. Fill the flask instead with carbon tetrachloride, adding 3 grams (1/10 oz.) of iodine to turn it dark. Now you'll quickly snatch your hand out of a fiery focus you can't see. Black paper held there bursts into flame. The dark carbon tet blocks visible light, but passes radiant heat quite freely.

How You Can Use

Heat That Travels Like Light

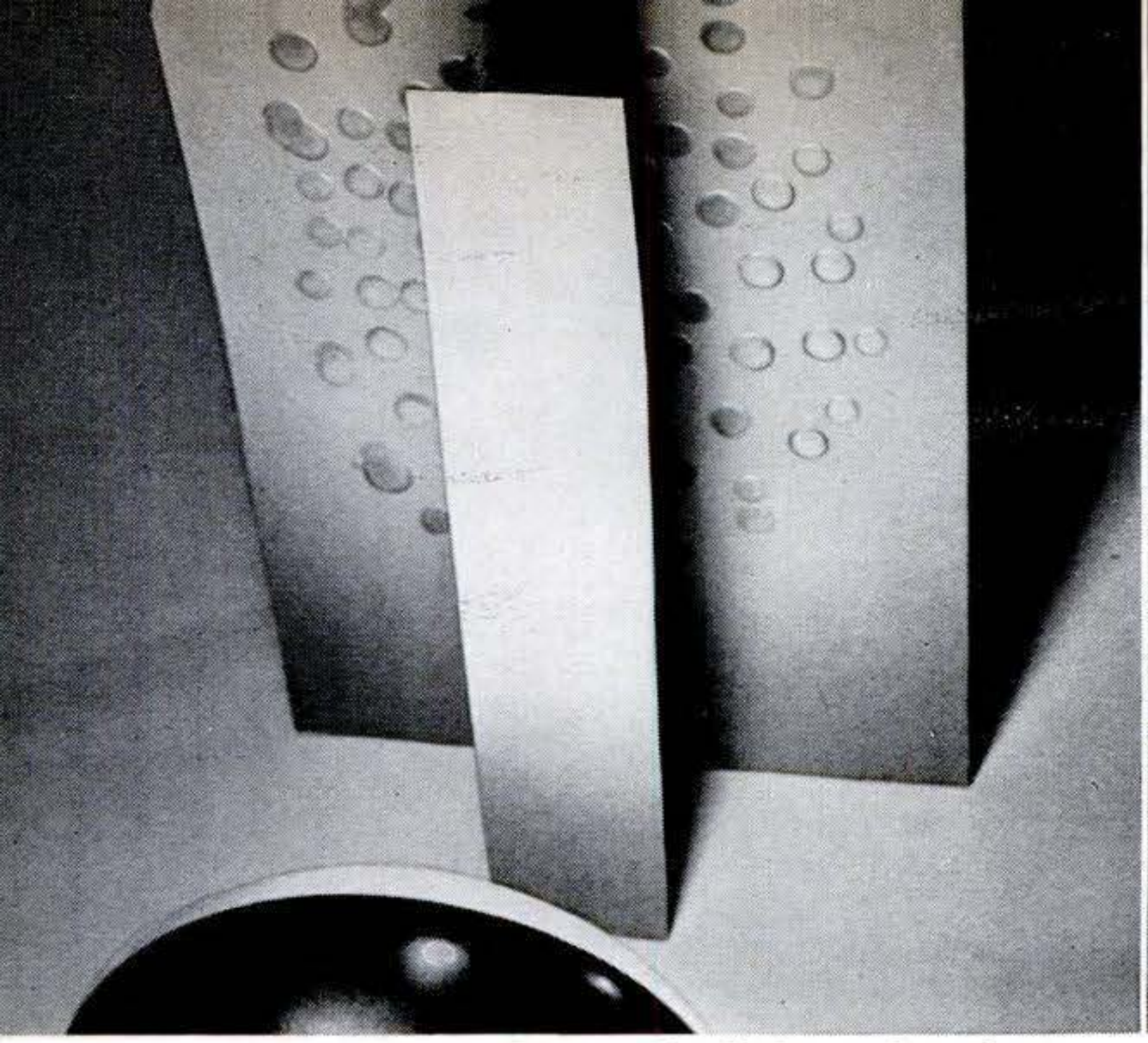
OLD as sunlight, radiant heat is the key principle in the latest broilers and home-heating systems. With inexpensive reflector bulbs, it's at your command to do such heat tricks as keeping you warm in a cold room or drying paint from the inside out.

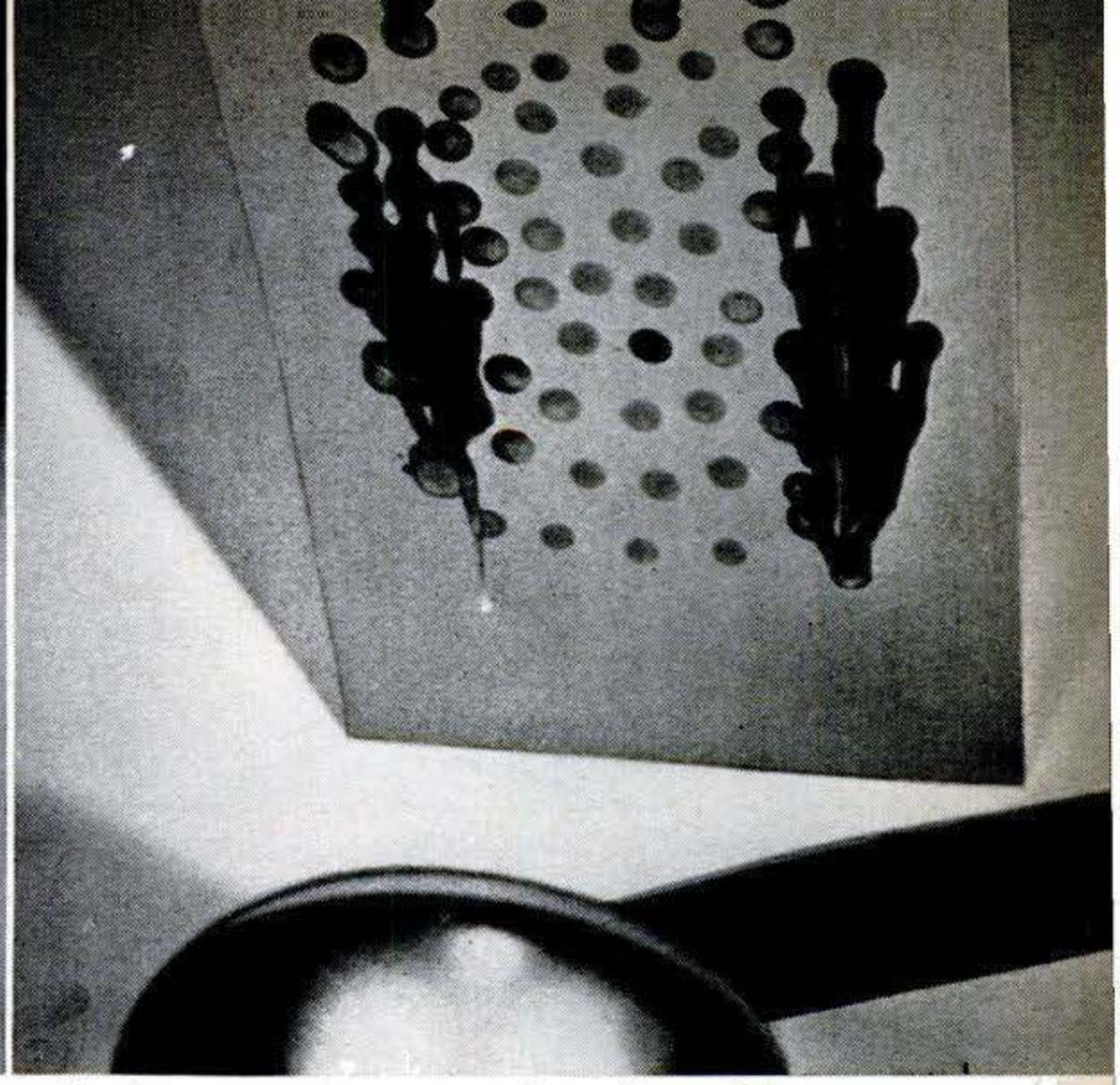
What's different about it? Touch a red-hot poker and conducted heat tells you about it. Above a radiator, you feel a warm air current—convected heat. Ride past a bonfire in a train and you feel a flash of warmth, gone in a split second. That's radiant heat, traveling with the speed of light.

Radiant heat is transmitted as electromagnetic waves, the same as light, radio and X rays. These waves cross the immense vacuum of space between us and the sun. They also pass unchanged through anything transparent to them (air for instance), so the coldest winds can't cool them. But when they hit something opaque, they are absorbed, made to release their heat energy, and things get hot.

Prove it with bulbs. You can demonstrate the difference between radiant heat and other forms with one or two 250-watt reflector infrared bulbs, or even ordinary store-window reflector bulbs, which radiate plenty of heat energy. And when you're through with the experiments, put the lamps to the practical uses shown on a following page.—*Kenneth Swezey, Brooklyn.*

Copyrighted material

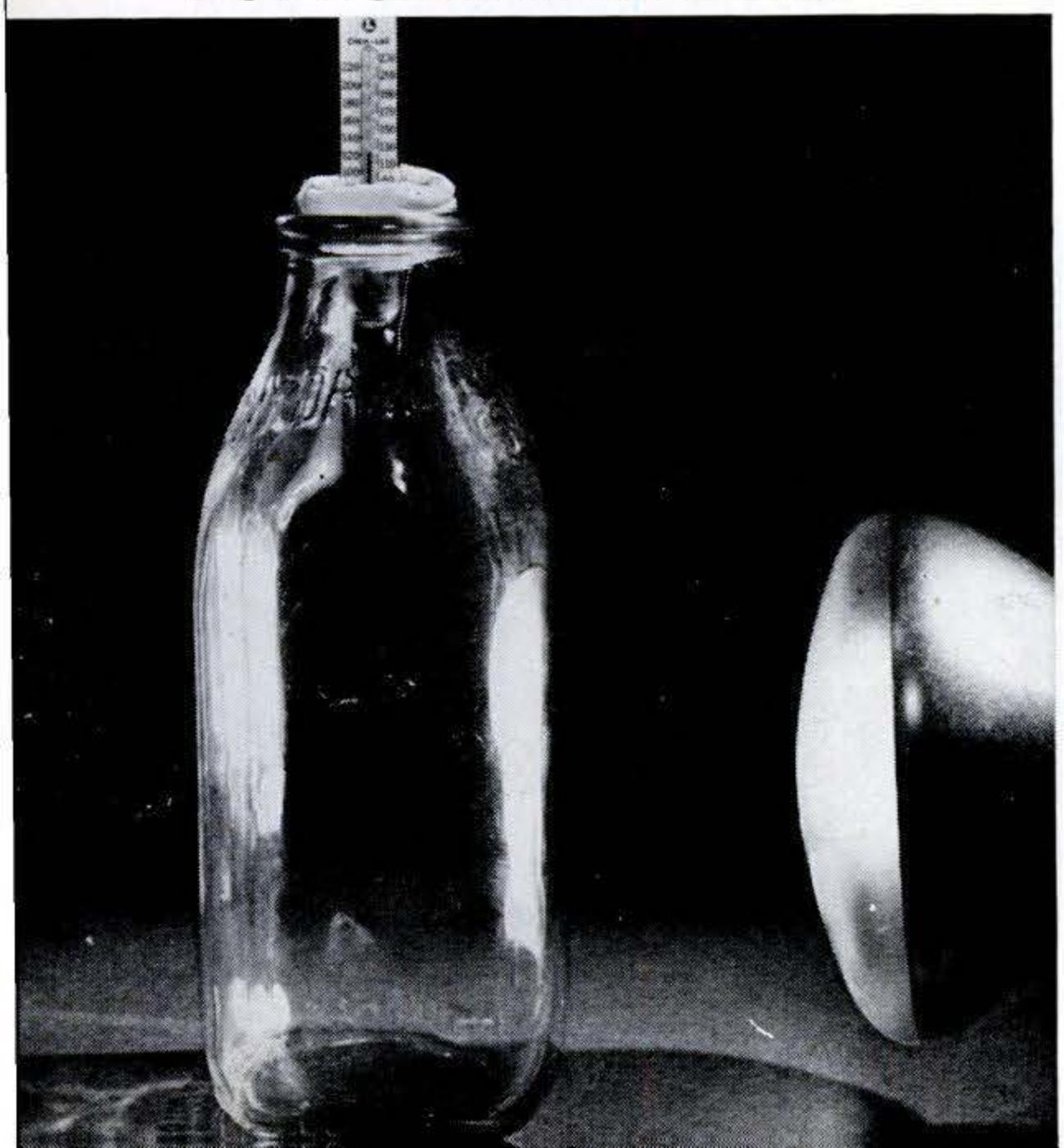




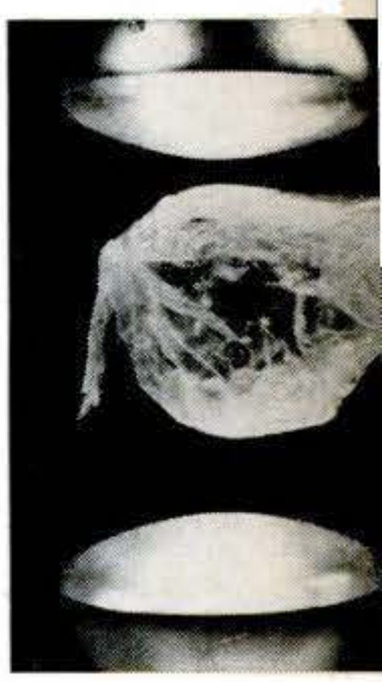
HEAT SHADOW Like light, infrared rays travel in straight lines. Therefore objects that block them will cast shadows outlined in heat. Dot a piece of cardboard with candle wax all over and set it up in front of a lamp, with a strip of cardboard between as at left above. Soon the wax dots on either side of the shadow cast by the strip will melt, while those in the shadow remain firm. That's why beach umbrellas temper the sun's heat.

GREENHOUSE Some things are more transparent to one wave length of infrared radiation than to another. Glass, for example, passes short waves from hot sources like the sun, but blocks longer infrared waves from bodies that are only warm. Radiant heat readily enters a greenhouse to warm soil and plants, but can't escape back through glass, because it has been transformed to a lower temperature at a longer wave length.

Wind cloth around a thermometer to make a tight seal in the neck of a milk bottle. Turn an infrared bulb on the bottom of the bottle. The air temperature will keep rising, although the glass and the air inside are heated slowly, because they lose heat even more slowly. Radiations from the warm air are too long in wave length to get out through the glass.



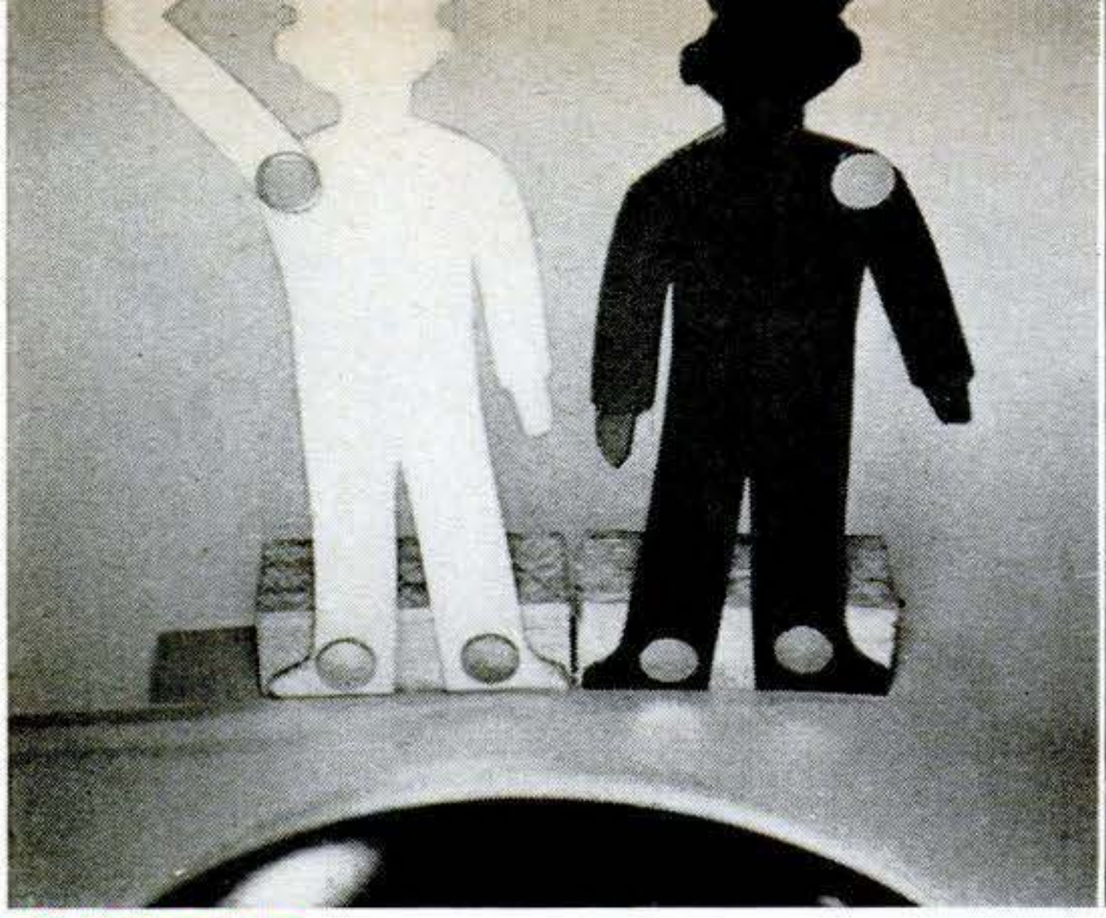
POPPING CORN Your friends will be almost too surprised to eat this popcorn when they see it popped in cellophane. Wrap some popping corn in clear cellulose tissue from a bread wrapper or pack of cigarettes and suspend the bag between two infrared lamps so that it touches neither of them. The corn blocks and absorbs the infrared rays and therefore becomes hot. Cellophane, almost transparent to the rays, stays comparatively cool.

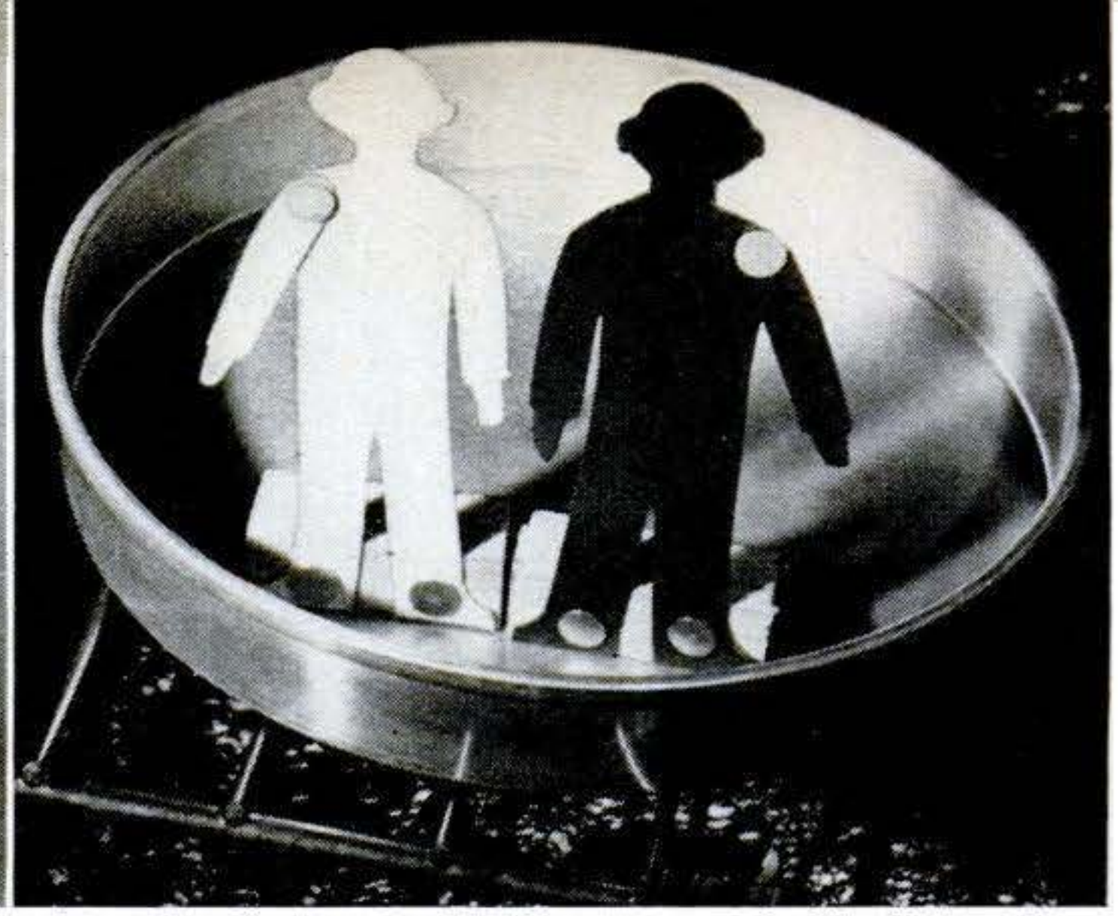


REFLECTION You can reflect radiant heat just like light. A shaving mirror or even a sheet of bright metal set at an angle in front of a bulb will direct the heat wherever you like. The bulbs themselves contain a parabolic reflector, made by silvering the glass shell. You can make home radiators more efficient with aluminum foil behind them to reflect heat into the room.

Please turn the page for more stunts.

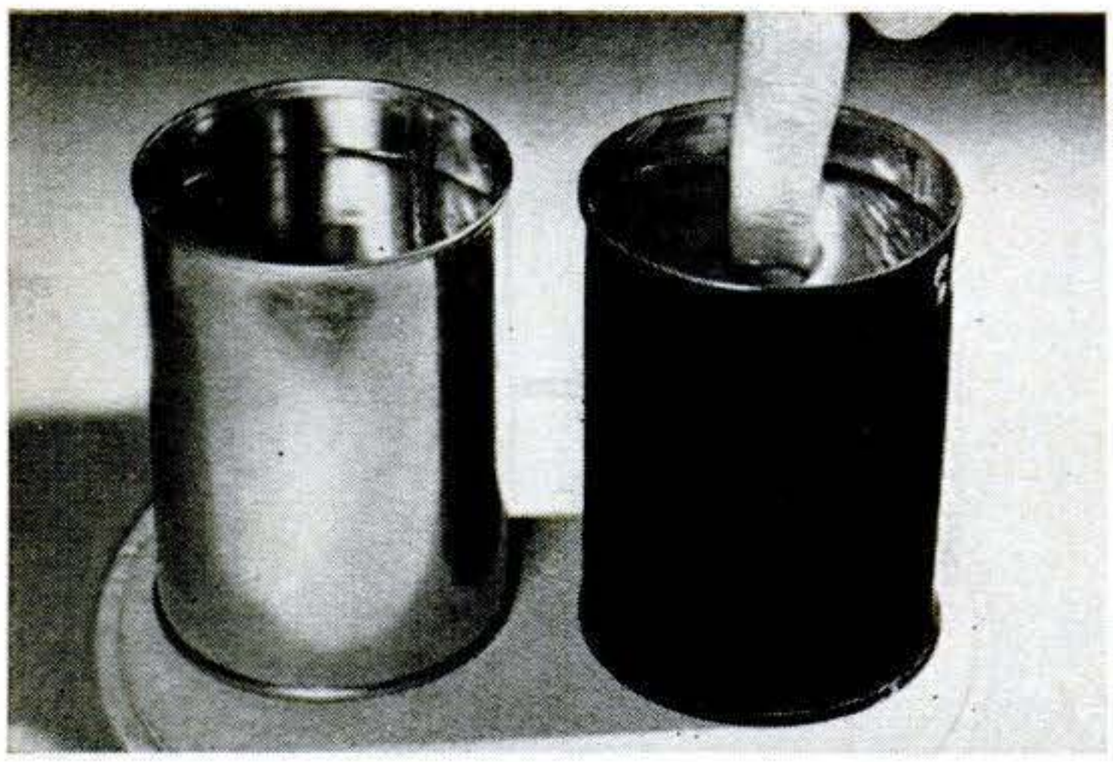
Copyrighted material





CLOTHING How much the sun warms you depends largely on the color of your clothing. White and light-colored clothes reflect radiant heat away from you, help keep you cool. Dark ones absorb it, making you warmer. One of these mannikins is cut from white cardboard, the other from black. A separate arm is stuck to each in an upraised position with a thumbtack and a drop of wax between.

When both figures are put in front of an infrared lamp, the fellow in black drops his arm before the one in white, as at left above, for the dark one absorbs heat faster. Put both figures in an oven (right) where they are heated by conduction and convection, and both arms will drop about the same time.

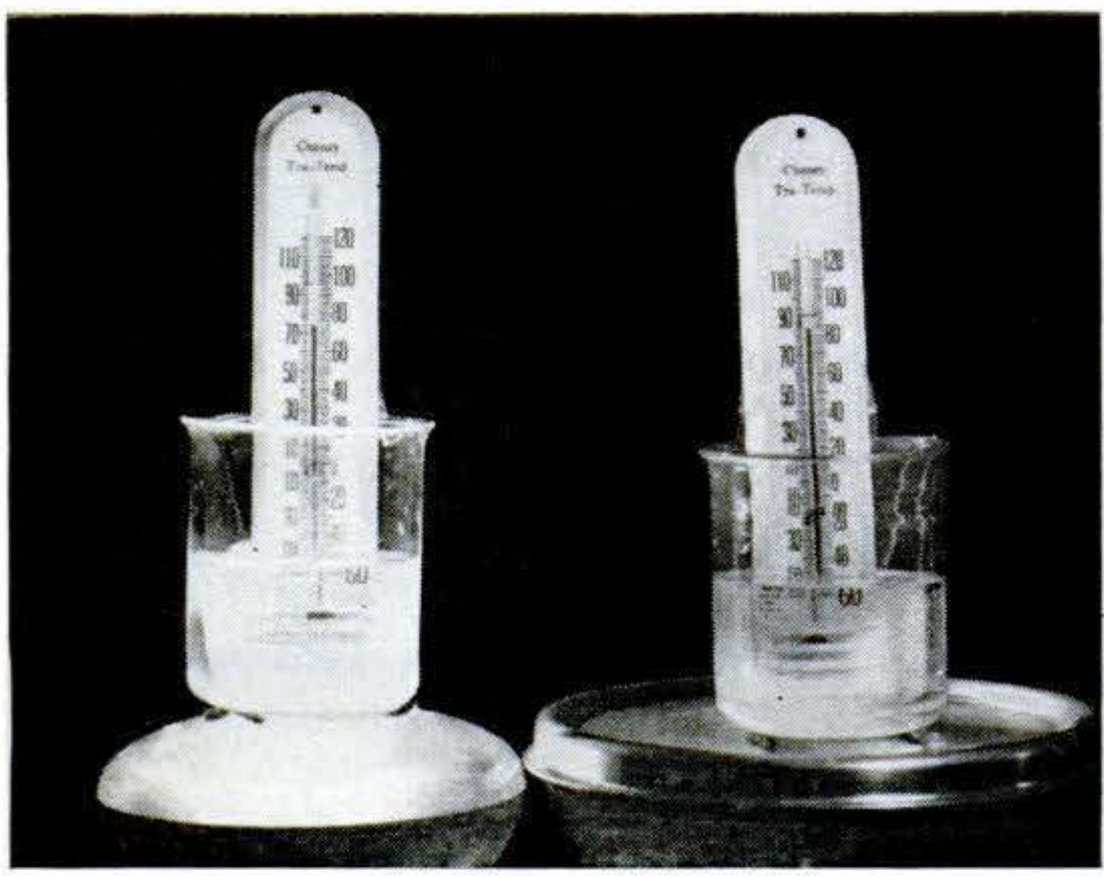


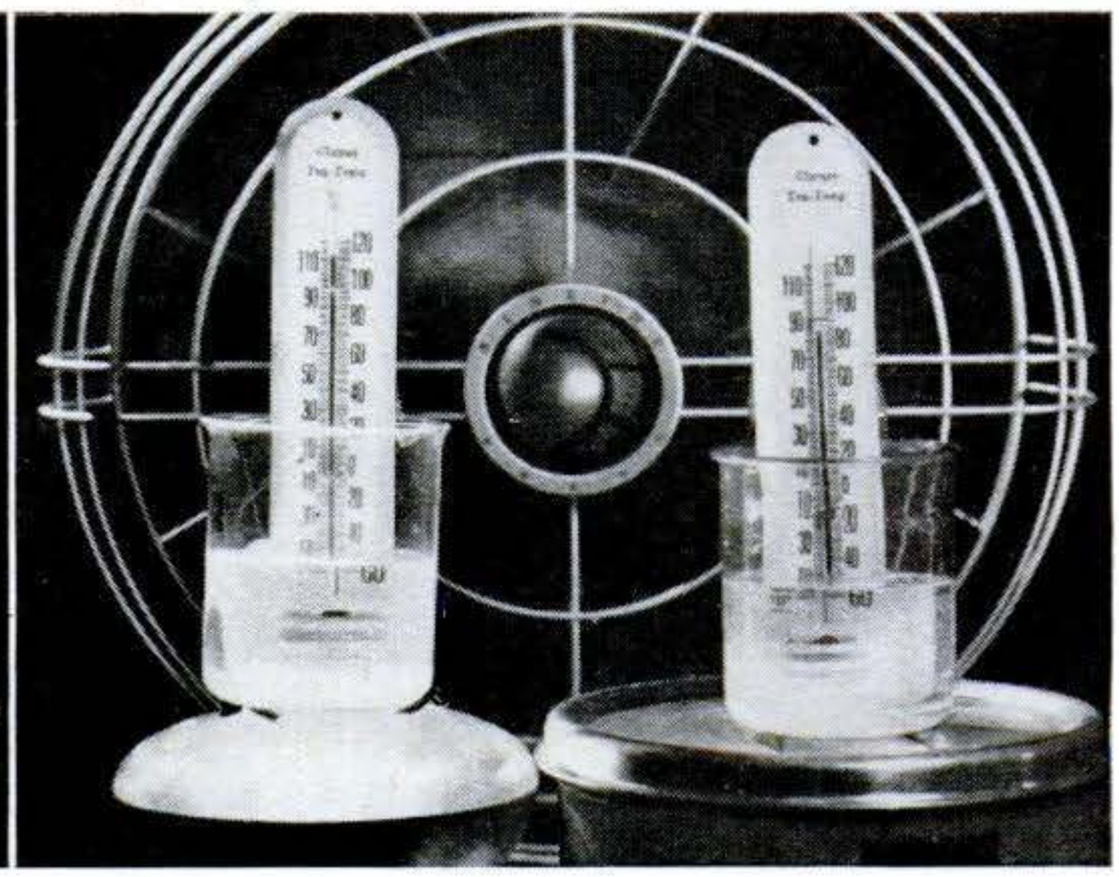
RADIATORS Anything hot is losing some heat by radiation. Surfaces that absorb radiant heat best also radiate it fastest. Those that reflect it readily are poor radiators. To show this, blacken one of two tin cans over candle. Fill both with boiling water.

You can stick a finger in the blackened can much sooner than in the shiny one, which radiates heat away more slowly. That's why heating radiators should be painted a dull and preferably dark color for top efficiency, and why utensils used on radiant burners ought to have black bottoms to absorb heat, and shiny sides to reduce loss by radiation.

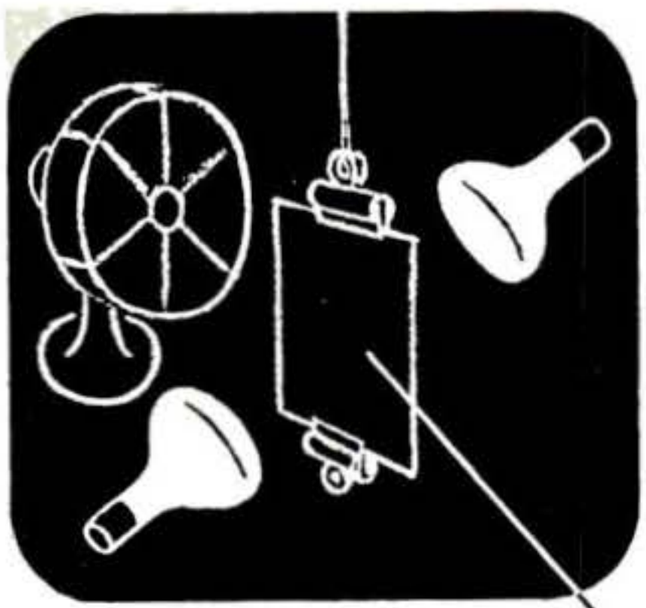
THE BIG DIFFERENCE This conclusive stunt will show you how radiant differs from convected heat. Fill two beakers with alum solution and put a thermometer in each. Place one over an infrared bulb, the other over an enclosed-top electric hot plate that has been preheated. Rest the beakers on short pieces of heavy wire to raise them above the heater surfaces a trifle.

The temperature of the solutions will soon rise, with the one on the hot plate probably gaining (left). Now set up a fan to blow through the spaces under the beakers (right). Almost instantly, the thermometer over the hot plate stops rising and soon goes down. Convection is disturbed by the draft, and heat no longer reaches the solution. The other thermometer keeps on, for air has no effect on radiant heat.





Copyrighted material



10 Uses for Infrared Bulbs Around the House

1 Film dries fast between two bulbs 18″ apart. Fan prevents overheating and speeds evaporation. Harden the film in chrome alum before drying.

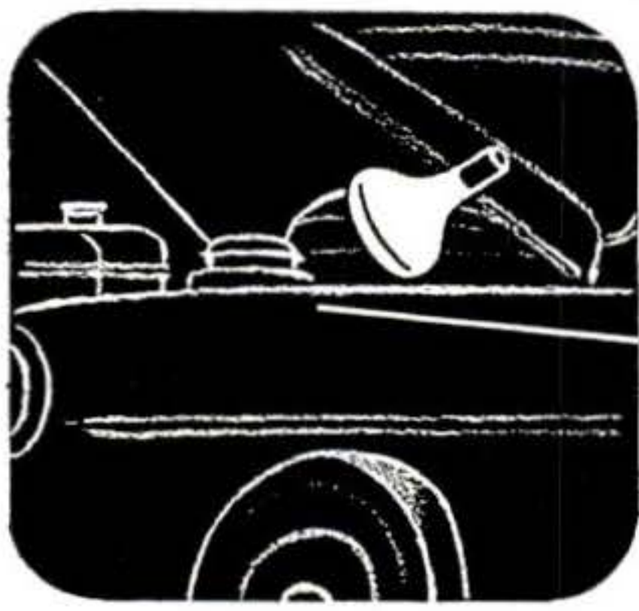
2 Quick meals. A bulb will thaw frozen foods in a hurry. It's a lifesaver when guests are coming or supper has been started late.

3 Take chill off bathroom with heat-resistant lamp in wire guard. These are made for use in spots where spattering water might break other kind.

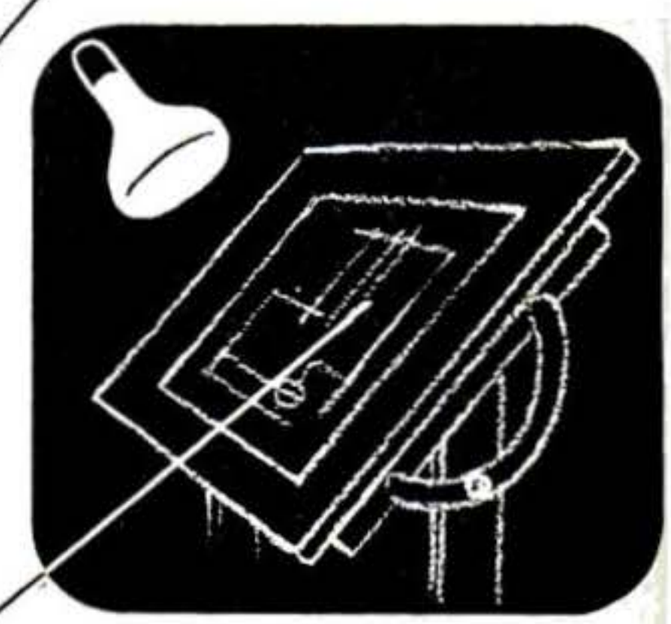
4 Soften up paint for removal with a bulb held close. Then scrape it off. This won't work on painted metal, however, or on heatproof paint.

5 Paint and touch-up jobs done with lacquer or enamels (not with oxidation-drying paints) dry hard quickly under lamps, and pick up less dust.

6 Tell the girls they can be on the dot for dates by using a heat bulb and a small fan to hurry drying when they wash their hair or apply nail polish.



7 Cold-morning starts are easier on your car if you warm the carburetor first. A bulb aimed at the crankcase will also keep oil fluid.

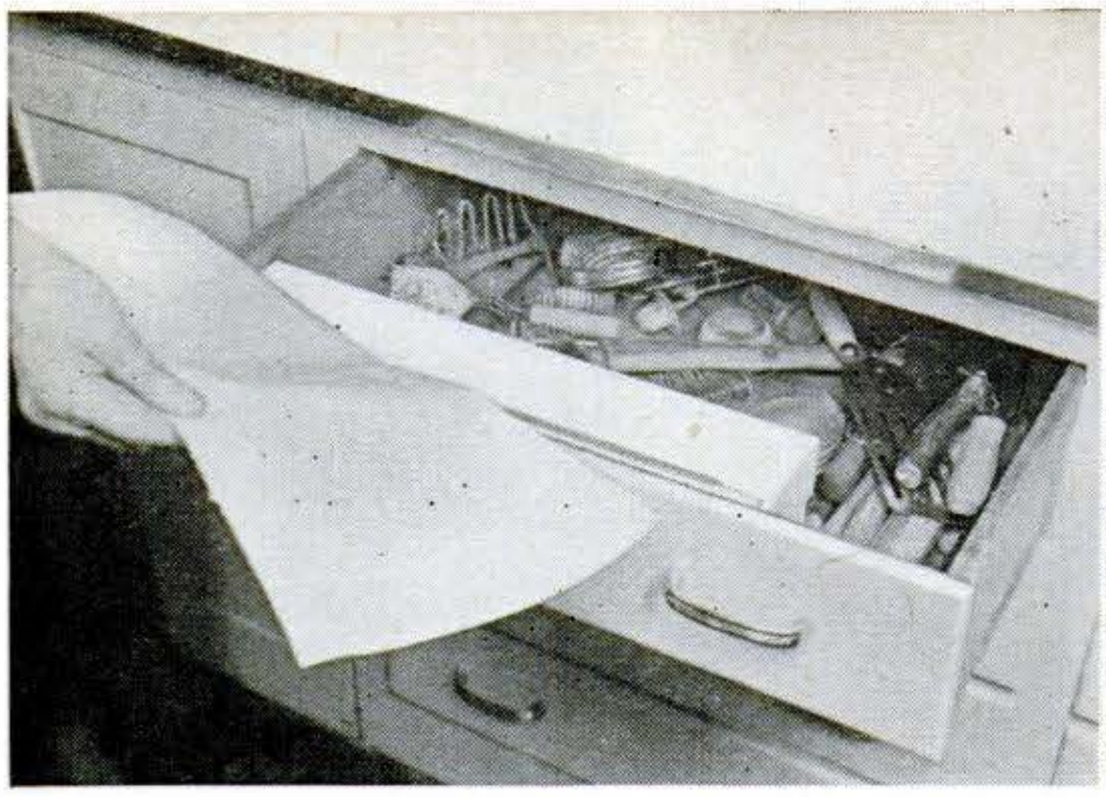


8 It's an art to turn out inked drawings in a rush. A heat lamp dries ink fast. Erasing and crosshatching can thus be done right away.

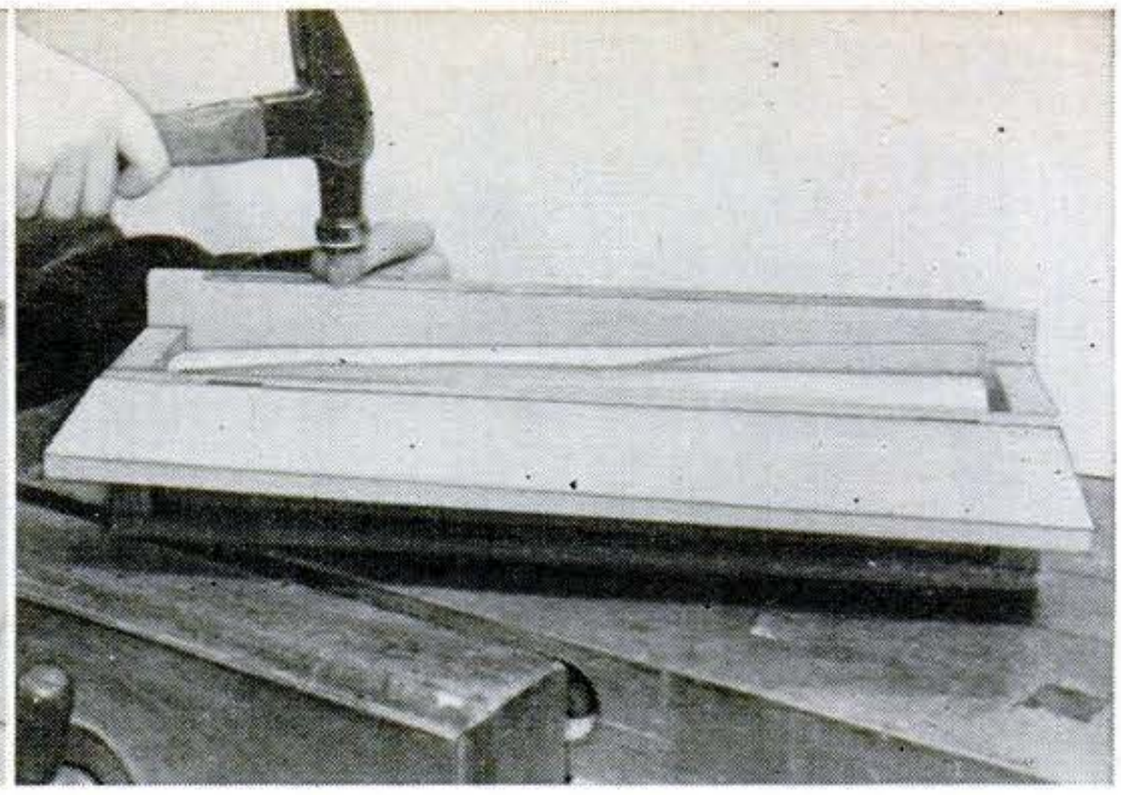
9 Work in a barn or other cold place? Infrared lamps won't heat it, but will keep you cozy if you spot them right and stay in the beam.

10 Thermoplastics bend readily if heated in an infrared beam. Heating can be restricted to a small area with a shield as shown here.

Copyrighted material



The dispenser can be fastened inside a drawer with angles. Place it so the cutting edge is level with the lip of the drawer.



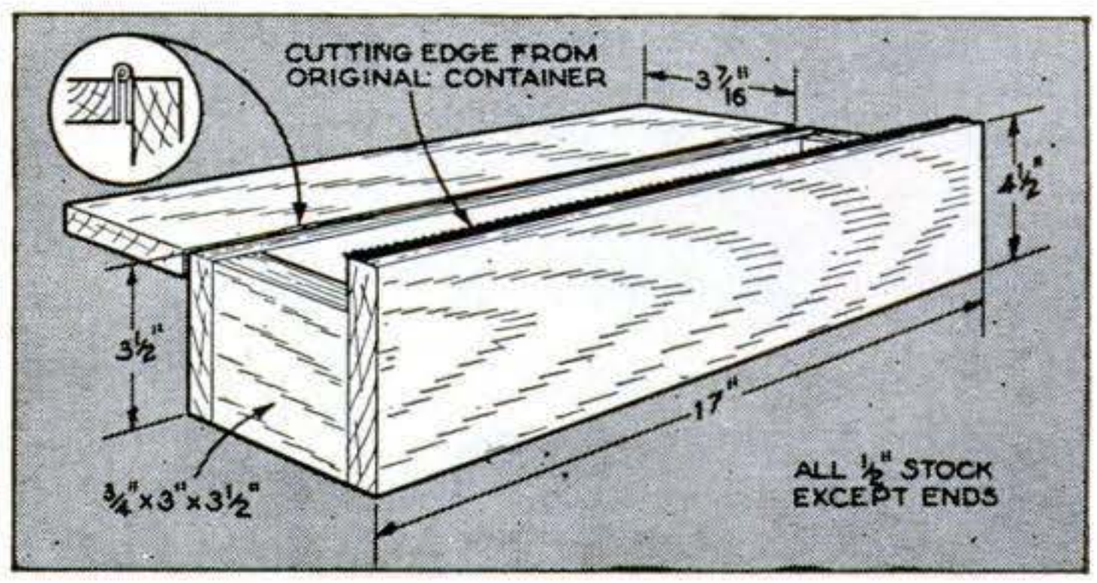
The top edge to which the cutter is nailed is ½″ higher than the cover. Raising the cutter makes it easier to pull and tear the paper.

Wooden Container Dispenses Kitchen Paper from Drawer

You only need use one hand to get a sheet of kitchen paper from this box. It is screwed inside a work-counter drawer to hold it down while you pull out the paper.

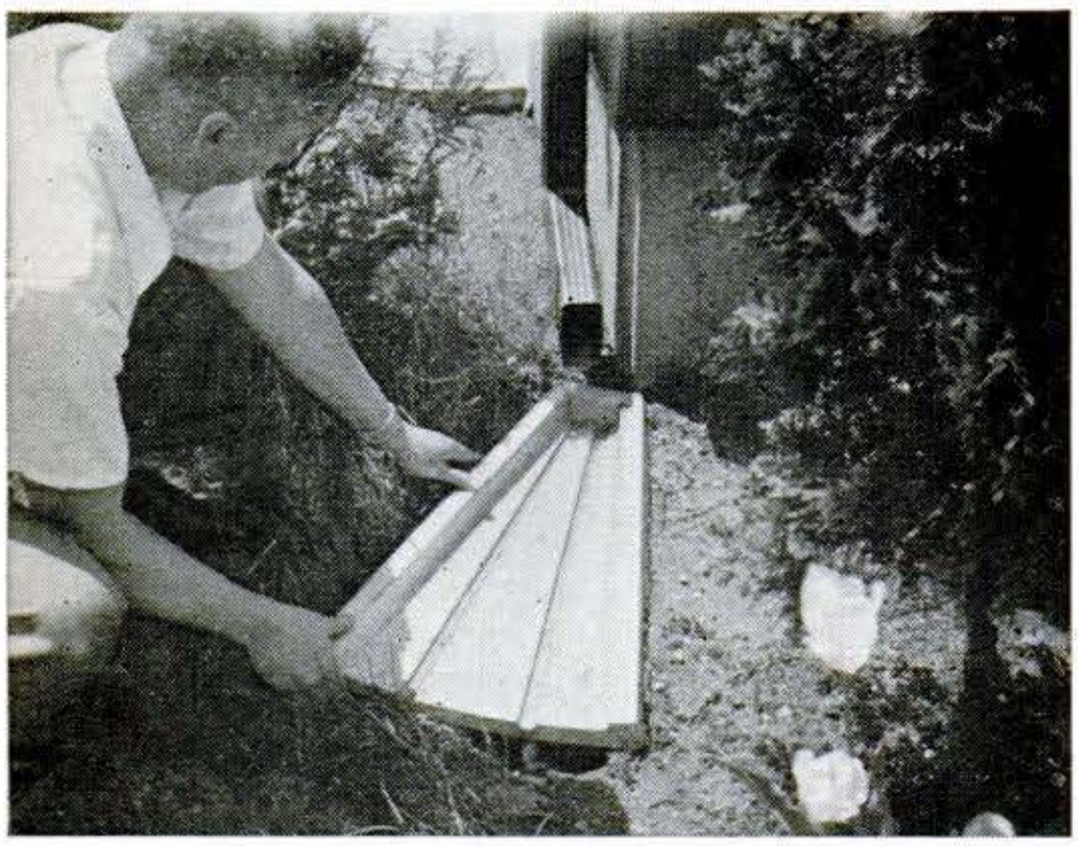
The dimensions given in the drawing are for paper rolls 15″ long by 2½″ in diameter. For rolls of a different size, make the inside of the dispenser the same dimensions as the outside of the carton in which the paper comes.

The dispenser is made entirely of ½″ stock except for the two ¾″ endpieces. The cover, which clears the backpiece by 1/16″, is attached with ½″ hinges; the other parts are glued and nailed together.



The paper knife, the metal cutting strip from a roll's original container, is nailed to the top edge. This edge is made ½″ higher than the cover so that when a sheet is torn off, a starting strip for the next is automatically left exposed.—*Walter Haase, Hartford, Conn.*

New Unit Spreads Rain Water



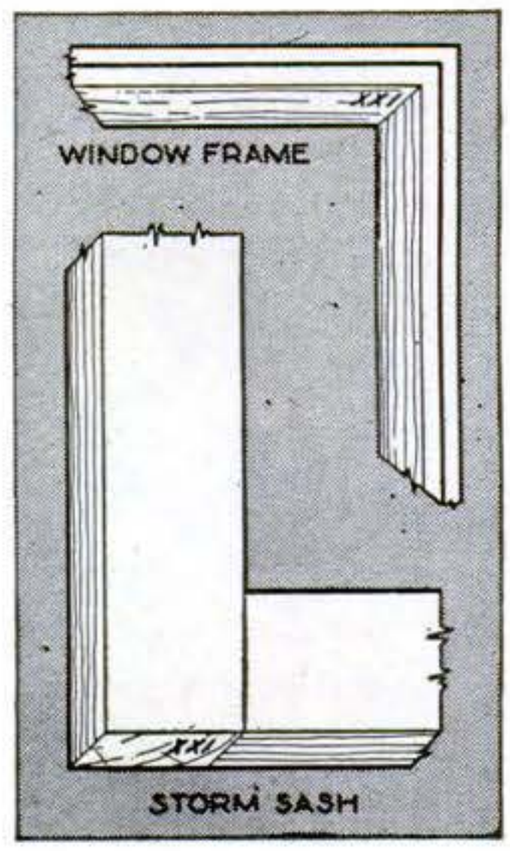
Placed under a downspout or outdoor faucet, this concrete unit fans out a stream of water, keeping it from digging a hole in a lawn or flower bed. A steel web embedded in the concrete makes the spreader virtually unbreakable. It's priced at $1.75 by Picone Bros., of Brooklyn, N. Y.

Envelopes Make Photo Hinges

Glued flaps on unused envelopes that come as mail enclosures can be turned into photo hinges. Cut rectangular pieces from the adhesive flap, fold them, and the hinges are ready.—*Pat Fey, New York City.*

Staples Identify Storm Sash

Here's an easy way to mark wooden storm sash and screens so you'll get the same ones on the same windows next year. Use a heavy-duty stapler to make Roman numerals in the sash and window frames. Brush varnish on staples to prevent rust.—*S. P. Giebelhaus, North Edmonton, Can.*



Copyrighted material

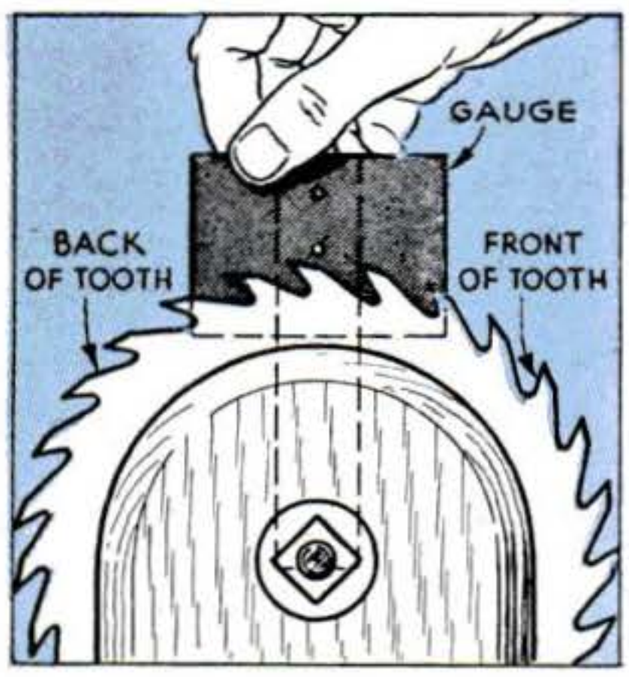
How to Sharpen Circular Saws

When a blade begins to munch through wood like an elderly beaver, it's time to unlimber a file and touch it up.

By Edwin M. Love

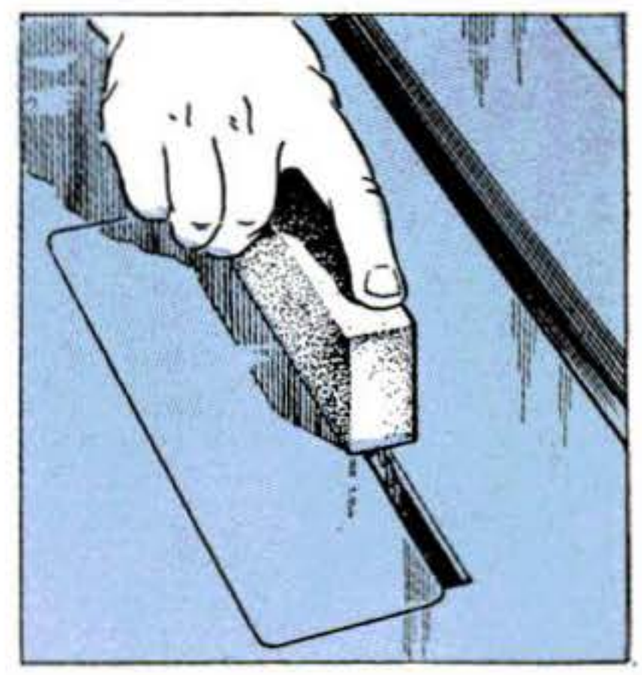
UNTIL science perfects non-dulling steel, circular-saw blades will have to be filed now and then. Don't put off sharpening them. A dull blade puts the brakes on your motor, overheating it, and may pop a fuse. Besides, the slow, rough cutting wastes time.

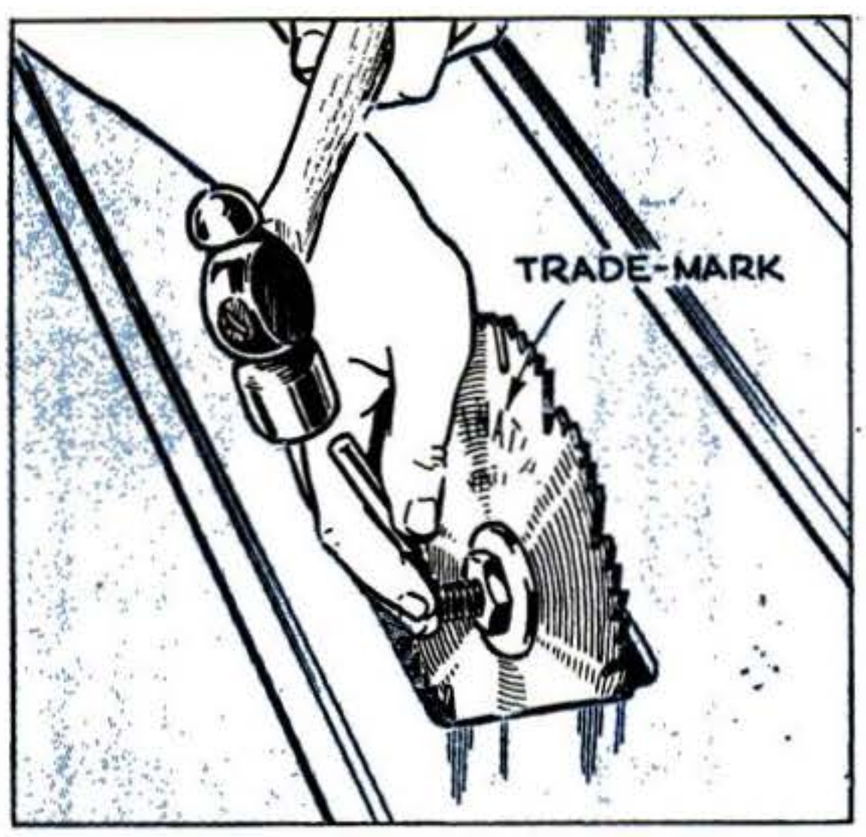
Jointing. As smooth performance depends on every tooth doing its share of cutting, all the points must be equidistant from the center. Jointing, or rounding a blade to even the teeth, is easily done. Adjust the blade or table so the points just graze a whetstone resting on the table insert, start the saw, and pass the stone over the insert



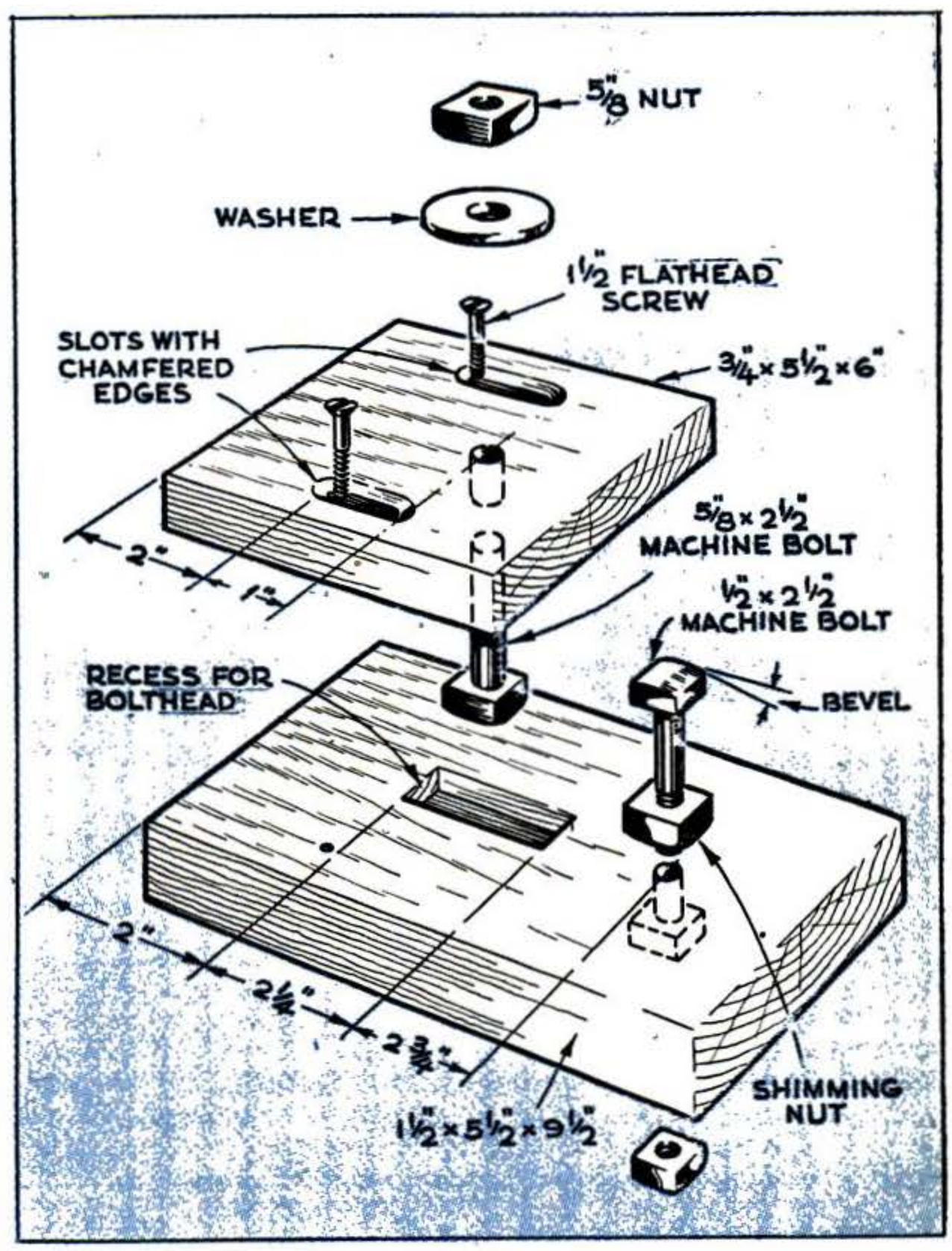
1. Maintain original tooth shape. Make a metal template, as shown at left. Trace the tooth form on the head. When sharpening the blade, follow the template to maintain tooth shape.

2. Jointing the blade. Adjust blade so teeth barely project above table. Run the saw and pass edge of oilstone over the blade (right). Teeth should just graze the stone. Each tooth should be slightly flattened. If not, raise blade a little more and make another pass with the stone.





3. Centering the blade. Before removing blade from arbor, turn it so trade-mark is up. Make prick-punch mark on arbor (above). Always mount blade with punch mark and trade-mark up. Replacing blade in any other position than one it was jointed in would make it run off center if hole in blade is slightly larger than arbor, or if arbor is sprung.

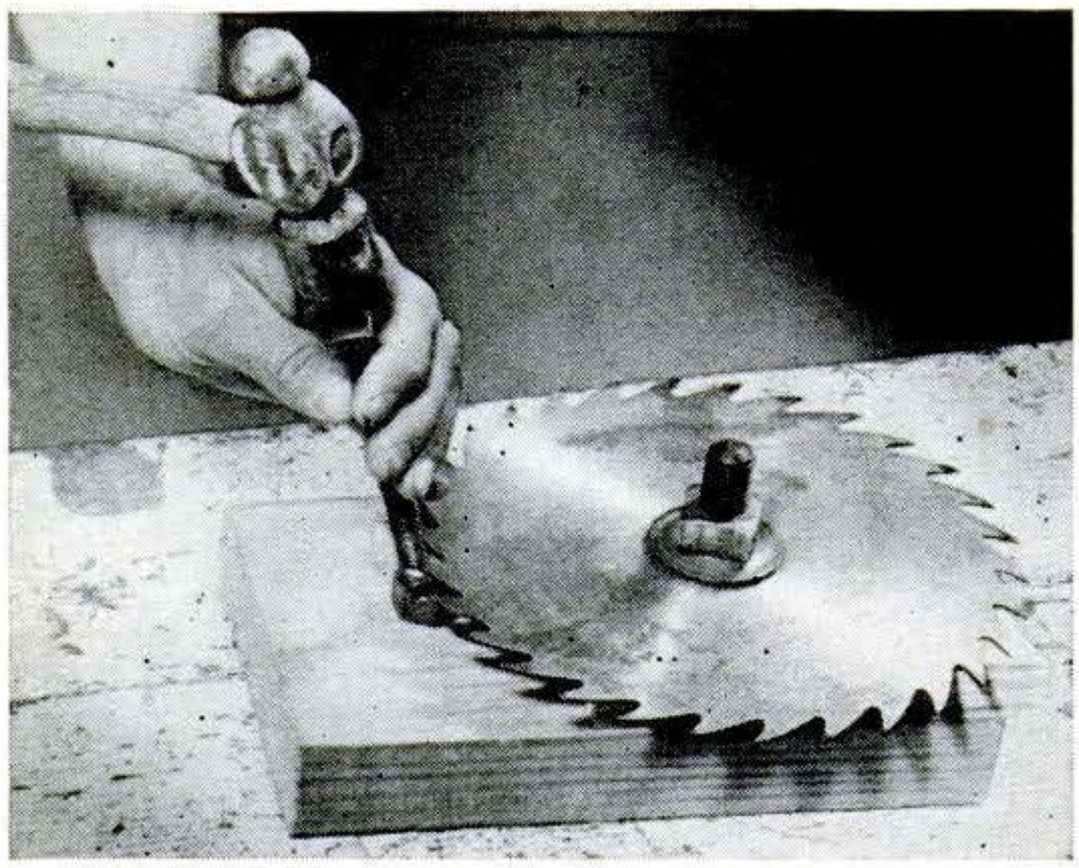


4. Making a setting tool. Drawing at right shows how to make a setting stake. The ¾" by 5½" by 6" block shims up blade and permits adjustment for size of blade. Bolt for blade must be same size as hole in blade.

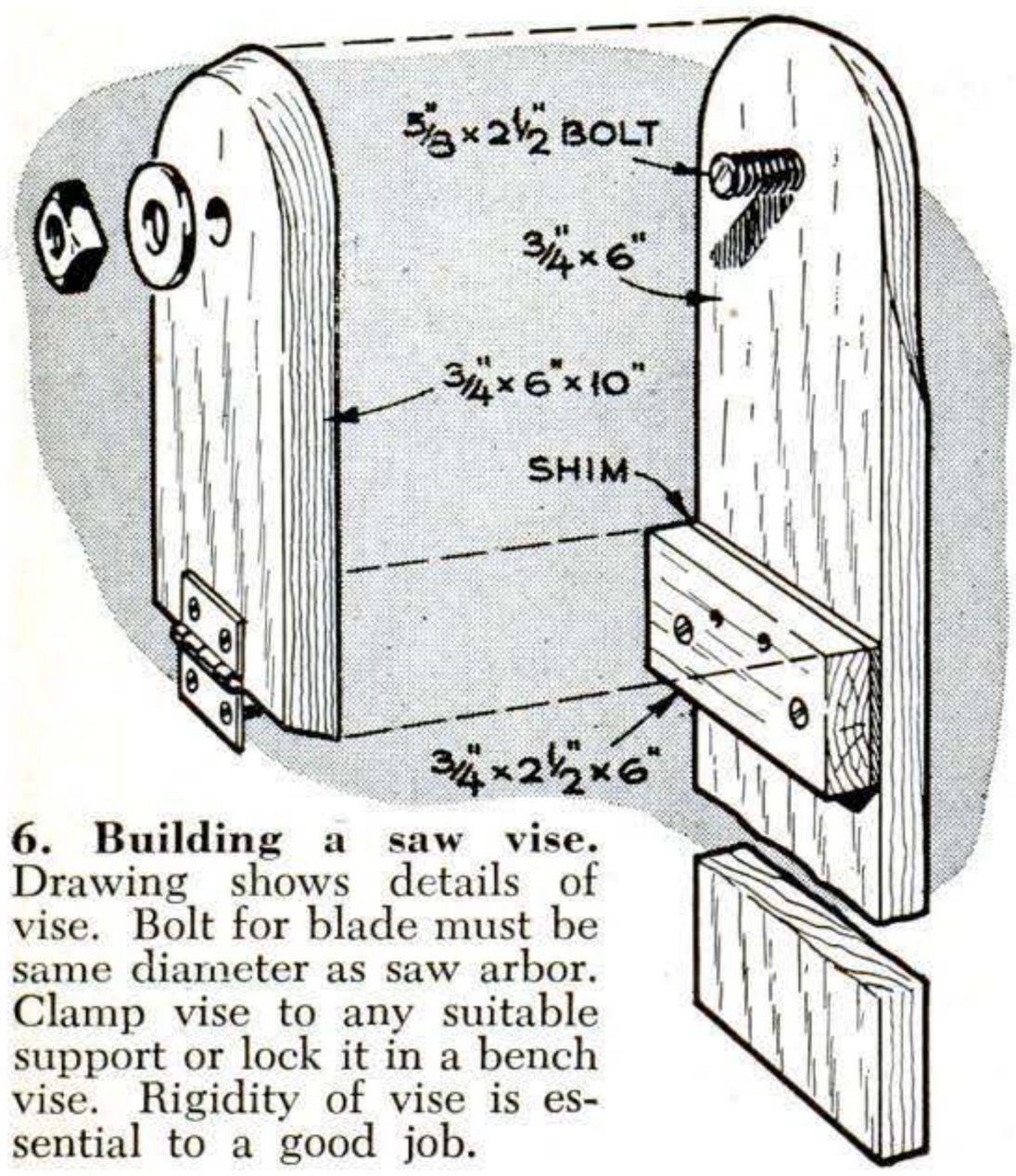
Copyrighted material

slit. If examination of the blade after it comes to a stop shows that all teeth weren't slightly flattened, repeat the operation with the blade raised a trifle. Before removing the blade, turn it until the trade-mark is up and make a prick-punch mark on the end of the arbor at the top, so you can replace the saw in the same position.

Most blades are spring set—the tips of the teeth are bent alternately to right and left to cut a wider kerf than the saw thickness. This reduces side rubbing. You can measure the amount of set very simply. Stand a try square on the table top with the outer edge touching a tooth point set to that side. Then slip a thin wooden wedge between the square and the saw. Mark the wedge where it won't go in any farther, and measure its thickness at that point. This is the set.



5. Setting the teeth. Position blade so a tooth is over the anvil. Place end of bolt on tooth. Strike bolt head with light but firm hammer blow. Set every other tooth. Then turn blade over and set the other teeth. Teeth of light blades can be set about one-quarter of their lengths from the points. Set heavy-gauge blades one-third of their depth.



6. Building a saw vise. Drawing shows details of vise. Bolt for blade must be same diameter as saw arbor. Clamp vise to any suitable support or lock it in a bench vise. Rigidity of vise is essential to a good job.

Before filing, it's a good rule to make a T-shaped template of thin metal or plastic, the shank of which is notched to fit against the arbor while two or three teeth are traced on the head. Cut along the line or blacken the silhouette, and use it to check the teeth when filing them.

Setting. You can make your own setting tool. A bolt fastens the blade to a block of wood screwed to a base block that holds the anvil. The anvil is a second bolt with half its head beveled to the angle of set. The anvil bolt is adjusted so that its head is flush with the under side of the blade. With this setup, the blade can be turned so that a tooth lies on the anvil, to be bent down with a bolt driven with a hammer. After setting every other tooth, turn the blade over to set the remaining ones.

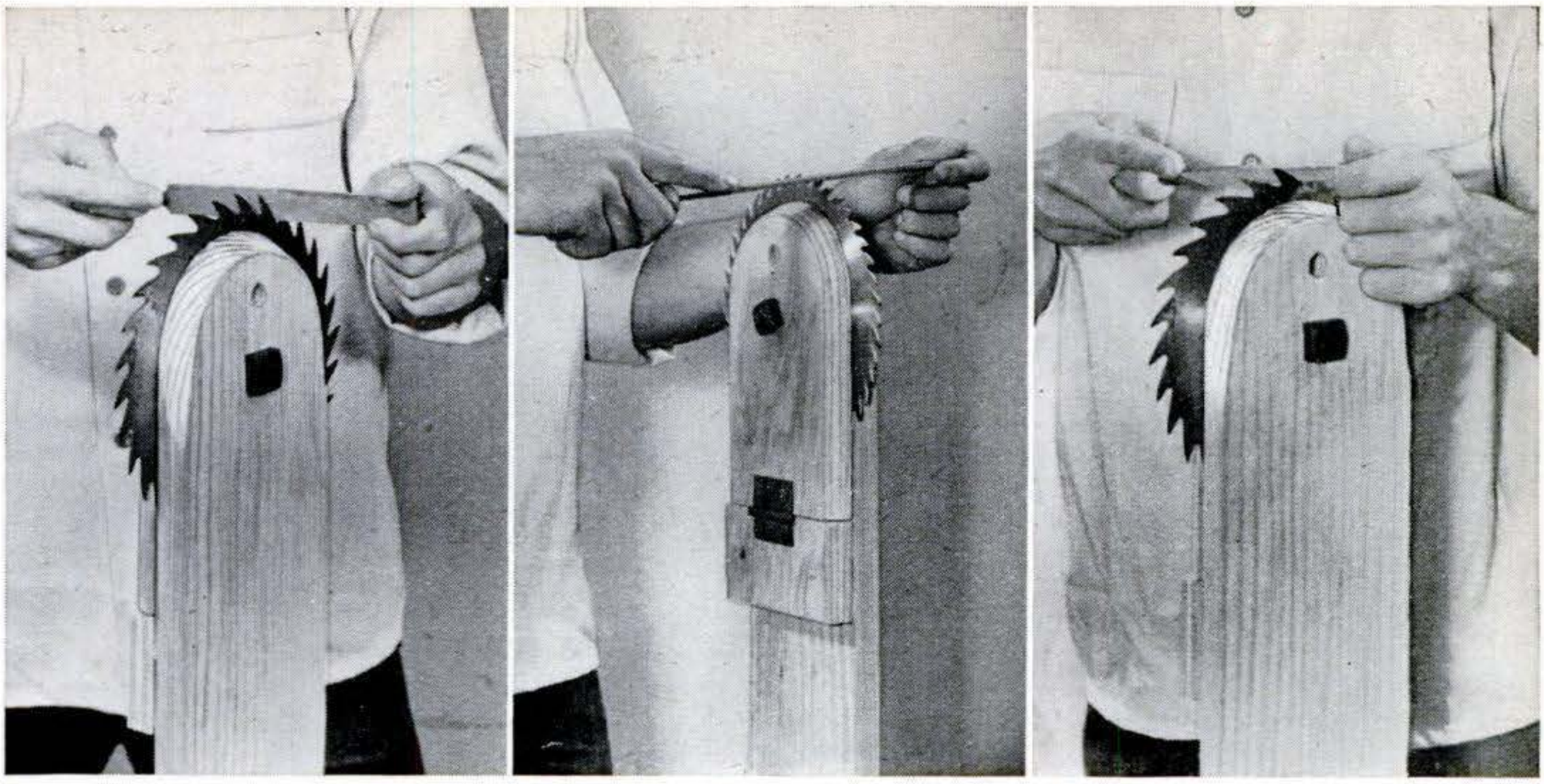
Making a saw vise. This is a 1″ by 6″ board rounded at one end and bored to admit a bolt the size of the saw arbor. Make a short front jaw, boring it to match and hinging it to the first board. With a blade held between the jaws by the bolt, the vise can be clamped against any suitable support, or in a bench vise, while the blade is filed. Be sure the saw vise is held rigidly enough to prevent chatter during filing.

Combination. The most-used blade in the shop is the combination saw, which rips and crosscuts. The simplest form is the modified rip saw. After rounding and setting, clamp it in the vise and file square across the fronts of teeth set away from you, keeping the "hook," or inclination, which generally is tangent to a circle half the diameter of the blade. Use an 8″ or 10″ mill bastard file with round edges, cleaning the gullets, or tooth bottoms, as you go. Then get the feel of the top bevel of the tooth by resting the file on it, and file to a bevel of 5° across and 19° sloping toward the back, stopping when the jointing flat at the point is gone. Reverse the saw or the vise to file the remaining teeth.

After several filings the gullets must be lowered with a round file turned as it is stroked forward. Strike a guide line on the blade by marking with a pencil as the saw turns on the arbor.

Novelty. The novelty type of combina-

Copyrighted material



7. Sharpening a combination blade. Use 8″ or 10″ mill bastard file with round edges. File fronts of teeth (left) first. Sharpen teeth set away from you. Reverse blade to file the others. Leave a little of the flat spot made in jointing as a guide to filing the back of the teeth. Check with your template from time to time to maintain tooth shape. When filing backs of teeth (center) stop filing as soon as the jointing flat disappears. Otherwise, the tooth will be short and it won't cut. From time to time, shape the curved backs of the teeth (right).

tion blade has groups of four crosscut teeth with a rip or raker tooth. The raker is filed square and from 1/64″ to 1/32″ shorter than the others, and has no set. The crosscut teeth are beveled on alternate sides, the fronts, 18°, the backs 12°, with the fronts radial.

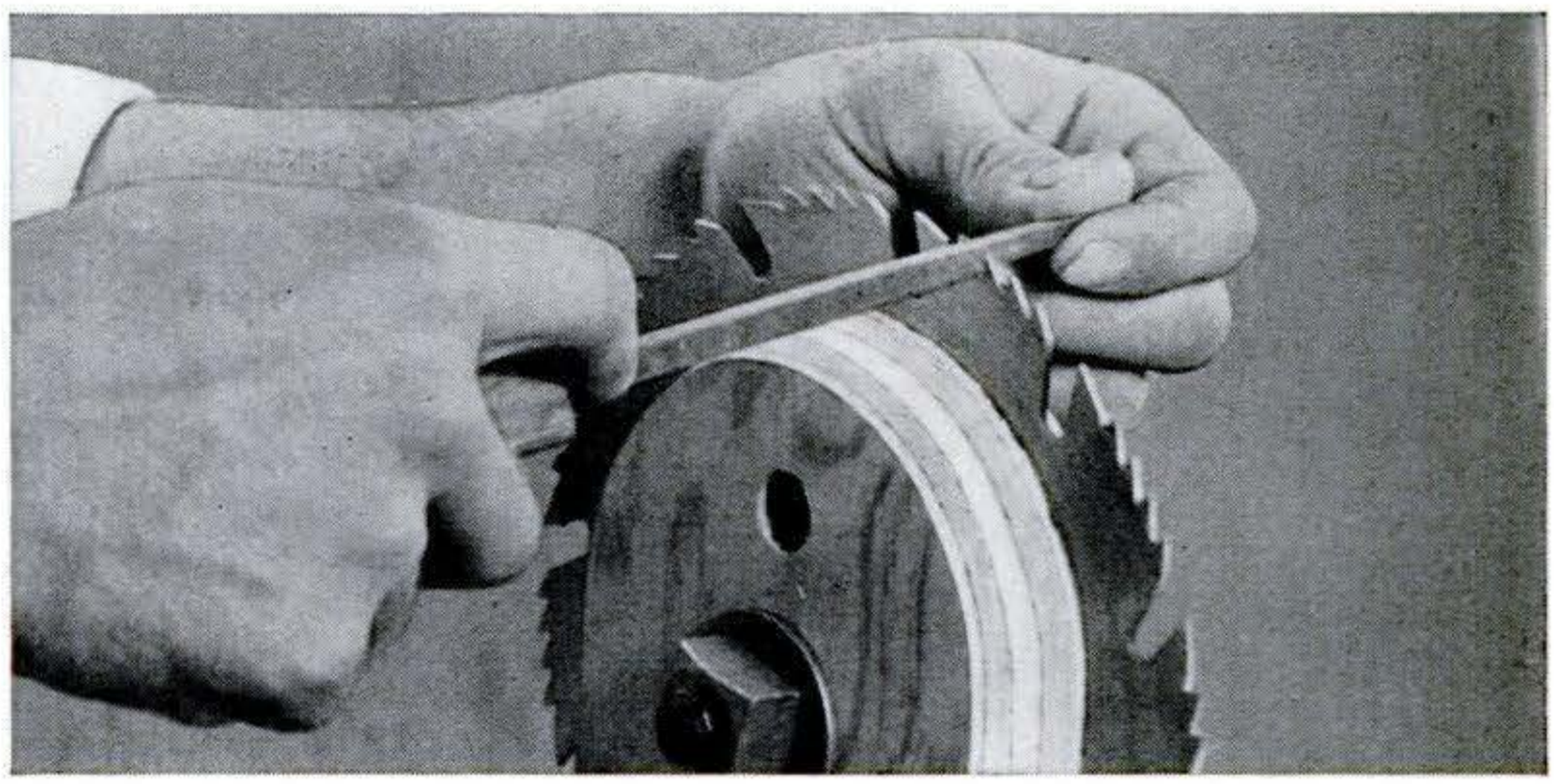
Hollow ground. A planer, or hollow-ground, saw is filed like the novelty saw, but has no set, As fronts and backs of the teeth must be filed separately, a cant file—a triangular file with two sides longer than the third—should be used. If an ordinary taper or blunt saw file must be used, be careful to press only on the tooth being sharpened.

Rip. Rip saws are filed like combination blades, but the backs are usually filed square across. Generally the teeth are larger.

Dado. Dado saws must be jointed as a set, so that the head will cut grooves that are as deep at one side as the other. Count the number of file strokes. The saw blades are not set and are filed with the handle held low, giving a sharp bevel to front and back, 40° and 20°. The fronts slope back at an angle of 20° with the radius. File the tops of the chippers, keeping them 1/64″ short.

Crosscut. Shops with much crosscutting work find a crosscut saw desirable. It is filed essentially like the cutoff teeth of the novelty saw, but the gullets are deeper, with the angle between teeth about 50°. Bevel 10° front and back for hardwoods, 25° front and 15° back for soft woods. END

A scale-model Jaguar that runs on electricity is next month's project for modelmakers.



8. Novelty blade. Teeth of this kind of blade are set; those of a hollow-ground blade are not. They are filed alike. A cant saw file is best, but a taper or blunt file will do. File the front of a tooth and then the back, following your template to keep the proper tooth shape.

Copyrighted material

Radiator Cover Hides Handy Clothes Drier

Bad weather needn't affect your wife's washday schedule. This indoor drier costs little to build and nothing to operate.

Clothes dry fast and clean and their moisture helps to freshen and humidify the air in the room. The drier holds a lot of wash.

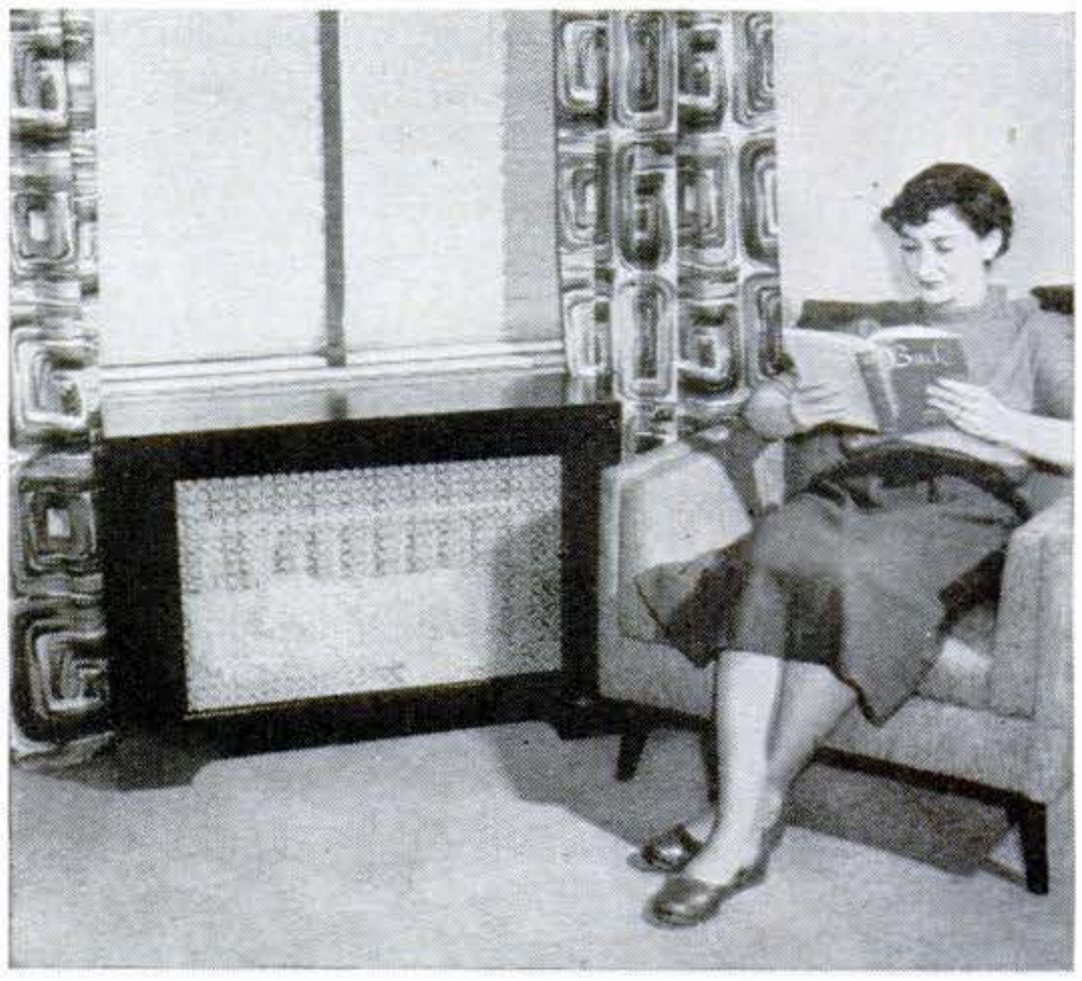
YOU can have this clothes drier without straining your budget. It's a good-looking radiator cover that conceals the plumbing in your living room and also gives your wife a place to quick-dry small laundry for six or seven months of the year.

It consists of an inner frame on which a clothes rack slides up and down, and an outer cover that encloses the frame. The unit shown was made to go under the lip of a window sill. If this should bring yours too close to the top of the radiator, you could make it flush with the sill.

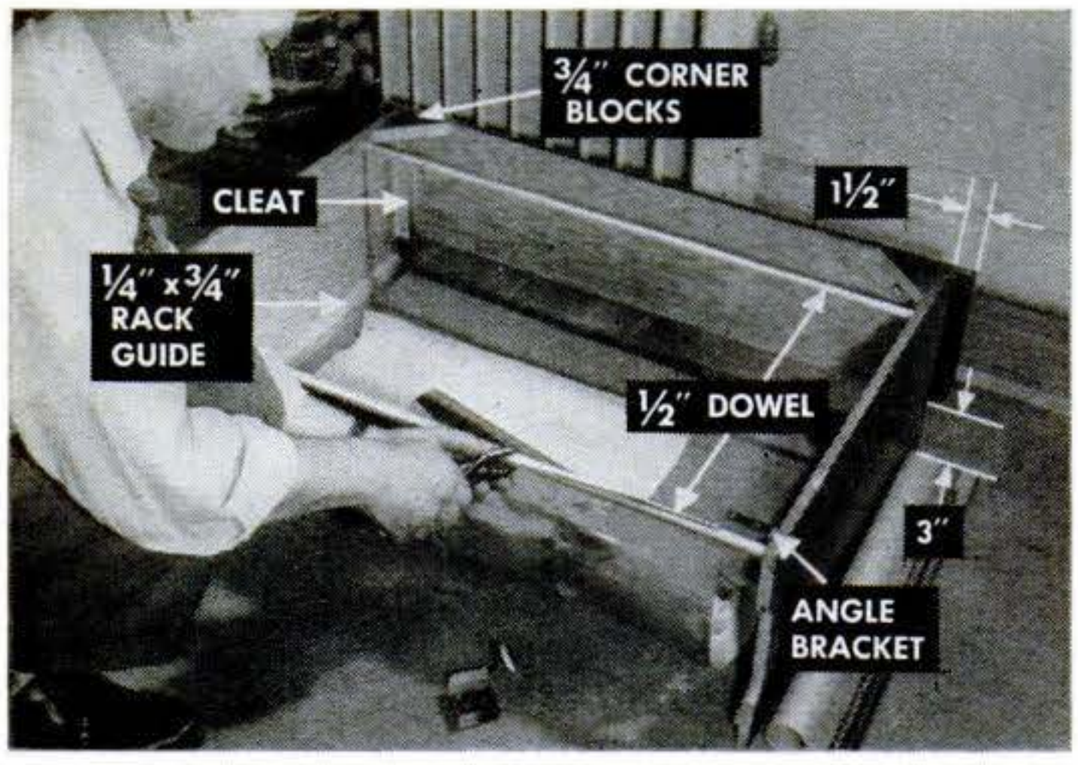
Build the frame to enclose the radiator, including the valves, with a 2″ margin all around. Make the cover at least 1″ higher and wide enough to fit easily around the overhanging top of the frame.

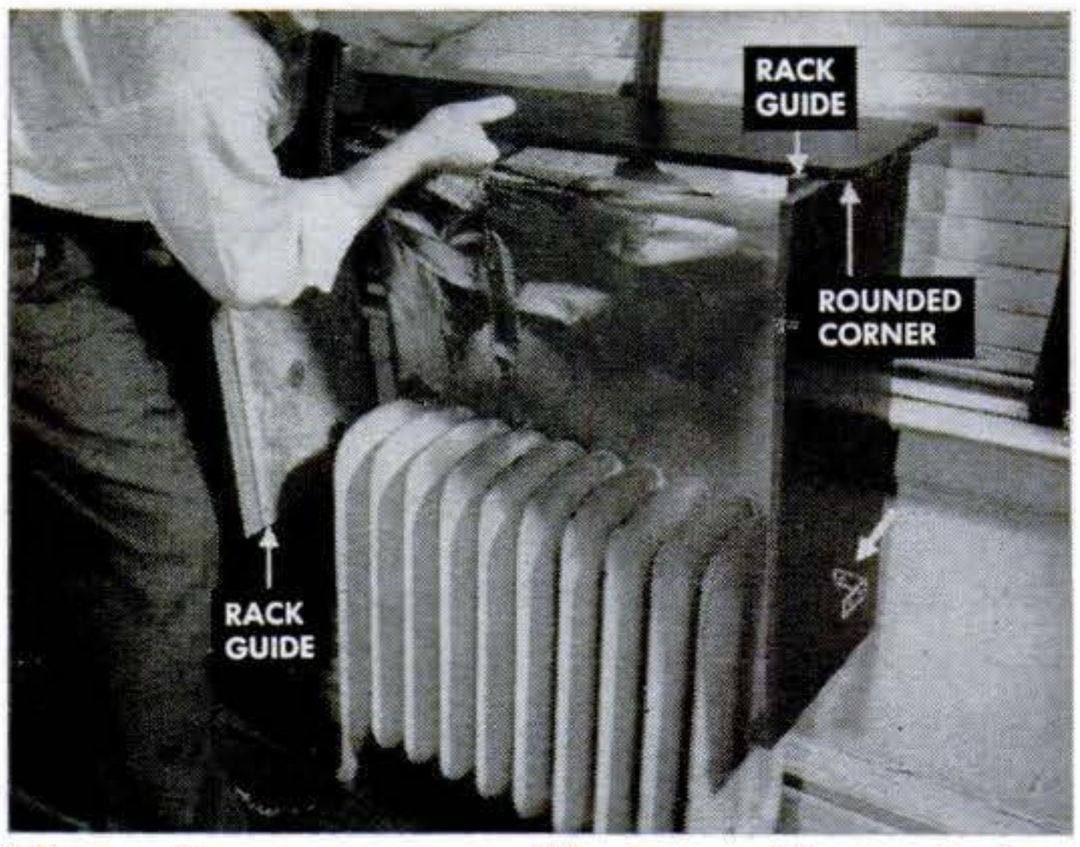
In the front of the cover, cut an opening

Laundry is hidden too. Only difference in the appearance of radiator cover is that it extends out a few more inches when clothes are in.



Open frame, 2″ higher and longer than the radiator, has a top 3″ narrower than the sides, but overhanging them 1½″. Secure dowel cross-pieces with one wood screw in each end. Attach reflector paper to lower dowel with staples or by squeezing in tacks with pliers.





Place frame over radiator, pulling pipeless end away from wall if necessary. Secure to baseboard with angle (arrow). Tack upper end of reflector paper to underside of the top.

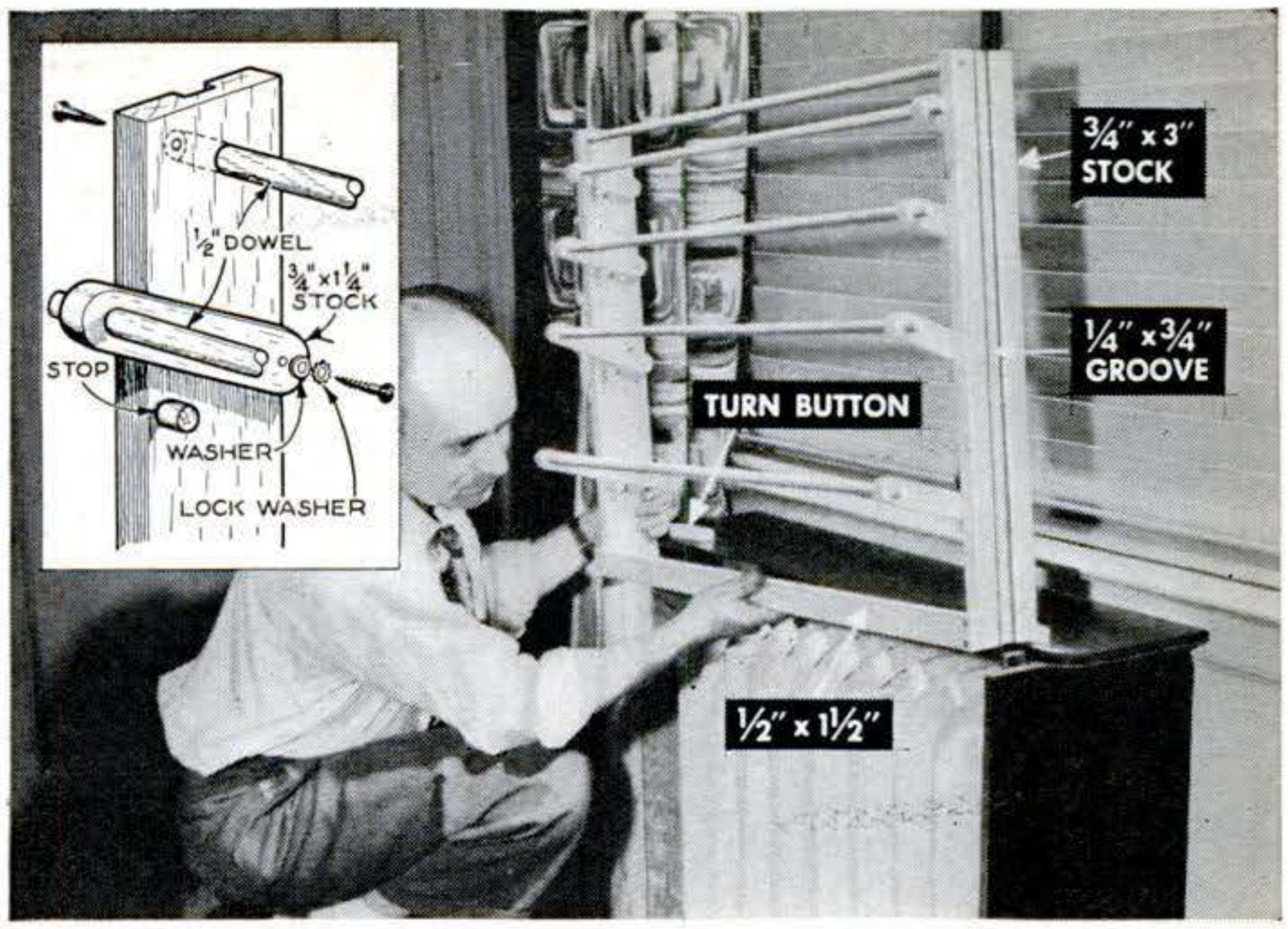
Copyrighted material

to leave a 3″-wide frame at the top and sides, and 6″ at the bottom. Then cut a 3″-high notch up from the bottom as a cold-air inlet. Cover the big opening with decorative screening or perforated metal, and frame it with ½″ quarter-round molding.

The rack rails are ½″ dowels through pivoted wooden arms. The rails must be staggered so that clothes on top won't cover those lower down. This is done by making each pair of arms 1″ longer than the pair next above it.

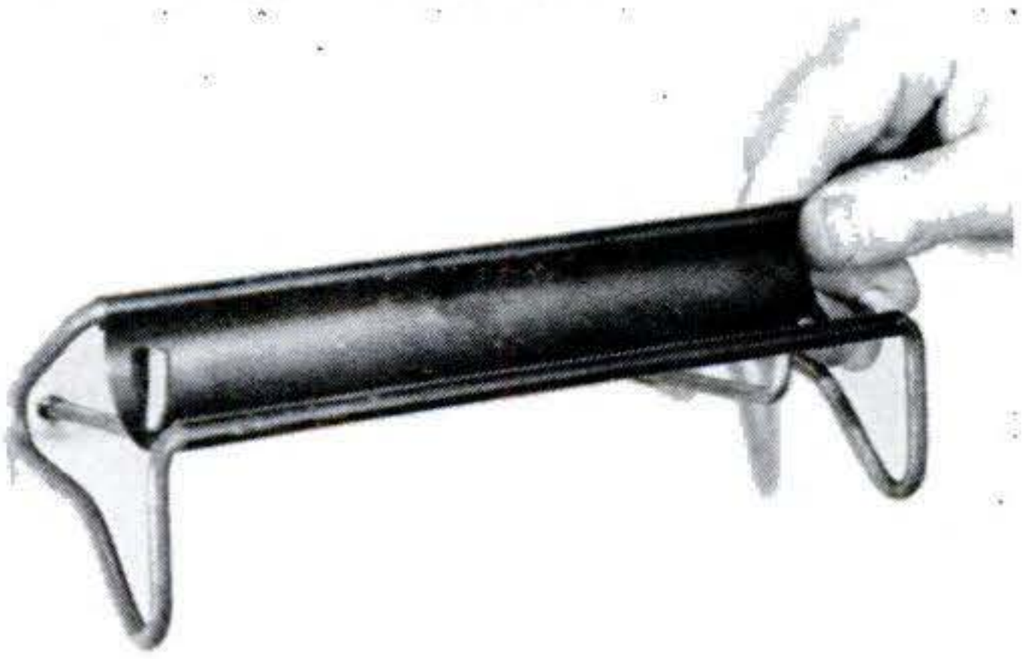
As a cover tends to reduce heating efficiency, it's well to add a reflective backing to direct heat outward. You can buy reflector paper made just for the purpose or else use aluminum cooking foil.

Tack reflector to back of the frame, and then slide the frame behind the radiator and fasten it to the baseboard with angle brackets. Fit the clothes rack into the rails, and push the front cover over everything. The unit will add to the appearance of your room even while it's making itself useful drying the wash.



Rack has grooved sides to slide on guides, with a dowel cross-piece at the top and a flat one below. Shellac sliding parts to keep them from absorbing moisture, and wax well. Turn buttons on top of the frame swing under pivot arms of lowest rail to hold rack up, making it easier to hang clothes.

Soldering Equipment Hangs Up



You can make your soldering-iron stand do double duty. Mount it on the wall with screw hooks, as shown, and it'll serve as a rack for iron and equipment. Make sure the iron is cool before placing it in the rack. The stand is easily lifted from the hooks whenever you have soldering to do.—*John J. Rea, Urbana, Ill.*

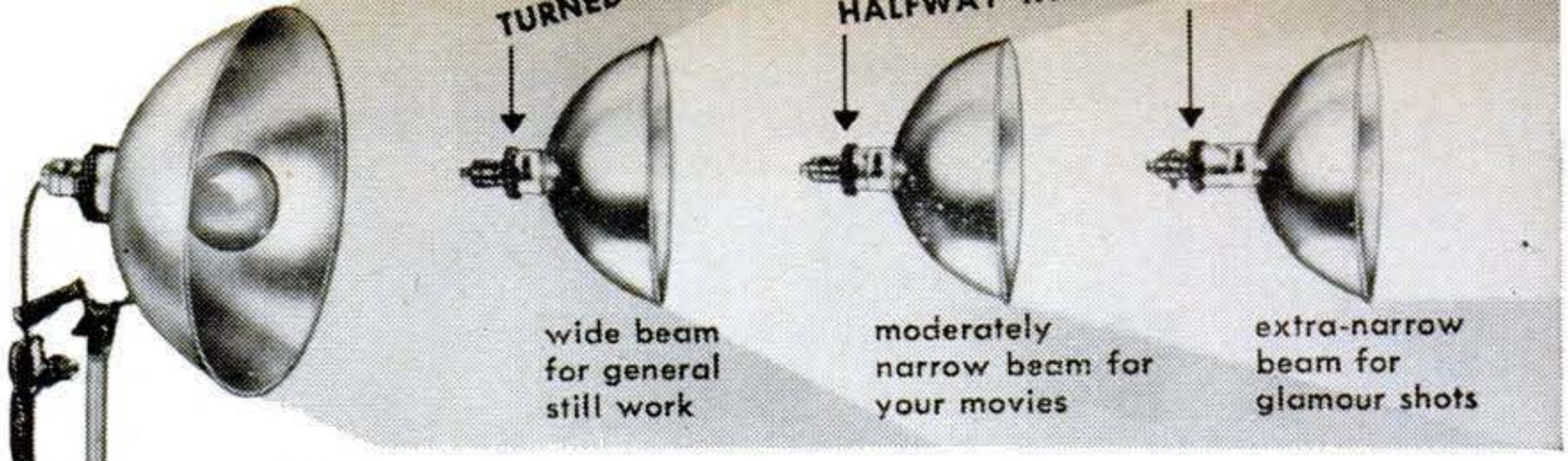
My Most Ingenious Solution

After I had tramped around to several stores trying in vain to buy replacement knobs for radiator valves, I hit on a very good substitute. What did I use?

Ordinary rubber coasters—the kind that are used under the legs of furniture. After I removed the broken wooden knobs, I drilled small holes in the center of the coasters. The machine screws that held the wooden knobs now hold the coasters in place on the valves.—Neal Flanagan, Brooklyn.

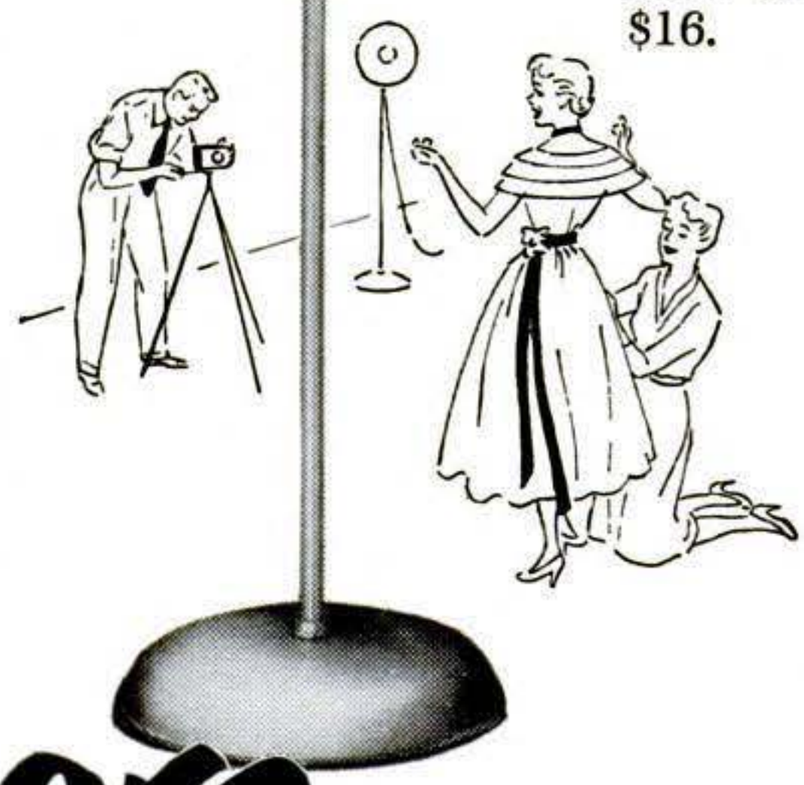
Copyrighted material

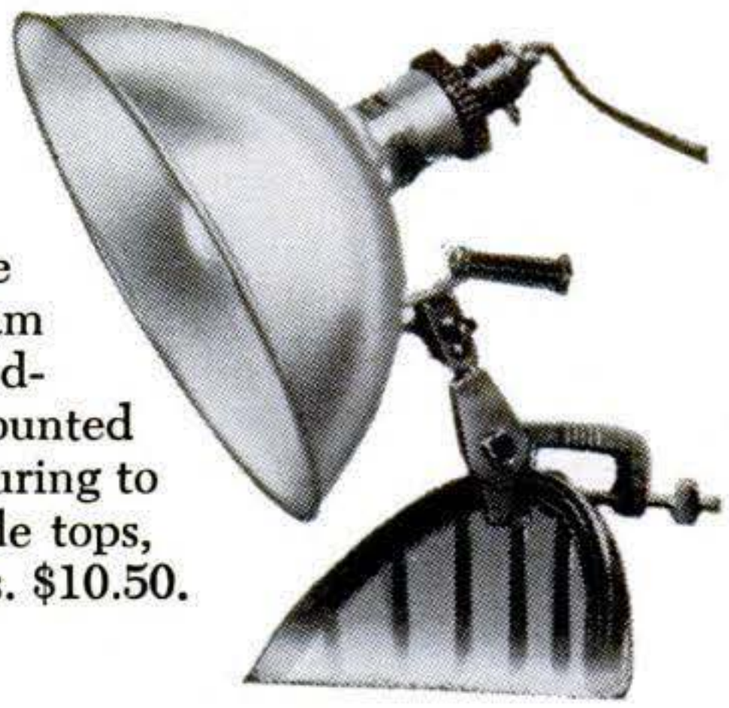
Bring the Sun Indoors



FLOODS help make superb indoor pictures

Kodak Vari-Beam Standlight—You get powerful, controlled illumination with 12-in. reflector, No. 2 flood lamp. Easy aiming with convenient handle. Column adjusts from 3 to 5½ ft. Rubber rim on base protects furniture. $16.



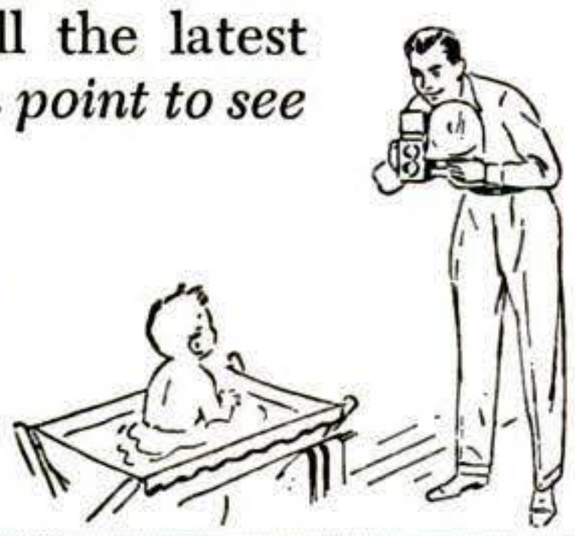


Kodak Vari-Beam Clamplight—has the same controlled beam features of the Standlight Unit, but is mounted on a bracket for securing to backs of chairs, table tops, and tubular surfaces. $10.50.

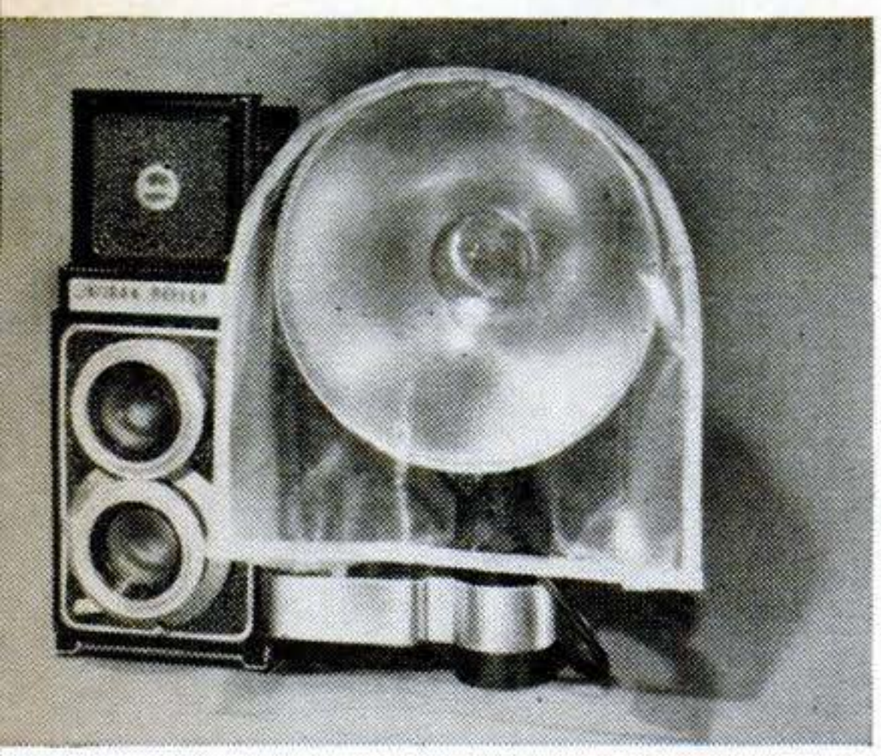
for some of the best snapshot opportunities

Some of the best picture-taking situations happen indoors—*right inside your family circle!* The Kodak lighting equipment shown on this page will help you capture those shots whenever you want. Maybe it's an informal one of "Sis" in her first evening dress. FLOODS are the answer, of course. Or maybe it's baby playing in his bath. What easier way to catch all the fun than with FLASH!

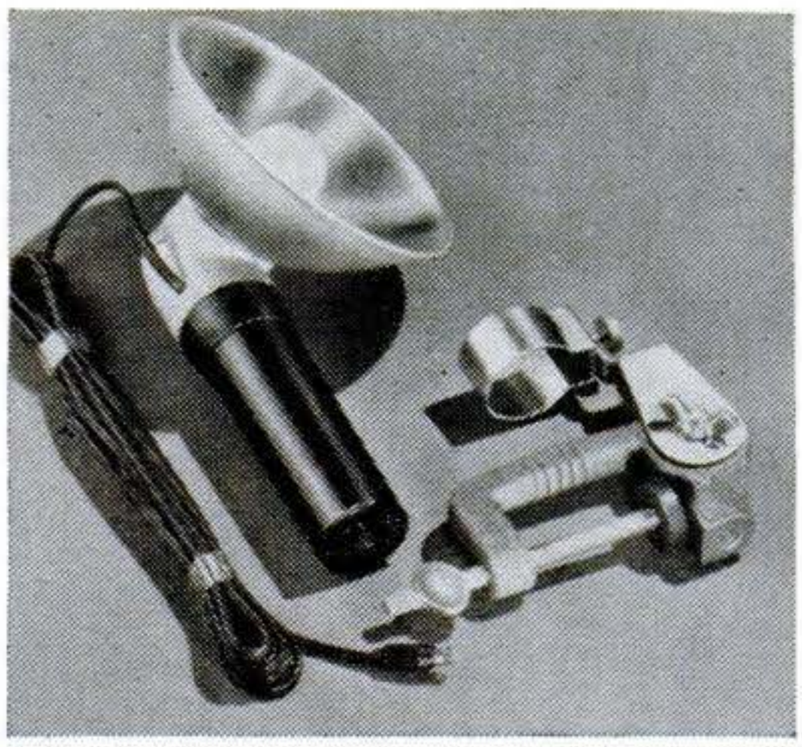
Practically every camera, new or old, can be adapted to indoor picture taking. Your Kodak dealer will be glad to show you all the latest equipment. *Make it a point to see him soon.*



FLASH helps catch those wonderful candids



Kodak Flasholder, Model B—fits most cameras with flash shutters. 2-way Flashguard offers protection in case lamp shatters . . . produces soft illumination for indoor color shots. Price, complete, $12.35.

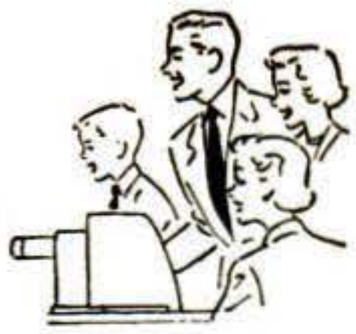


Kodak Flasholder Extension Unit, Model B—connects to Flasholder on camera, gives you multi-unit illumination for more natural-looking flash pictures. Attach to flat or tubular surface. $13.65.

Kodak B-C Flashpack—dependable "flash." Use in place of two "C" batteries in flash unit. 22½-volt battery in Flashpack charges condenser for abundant energy to ignite lamp. $2.95 (without battery).

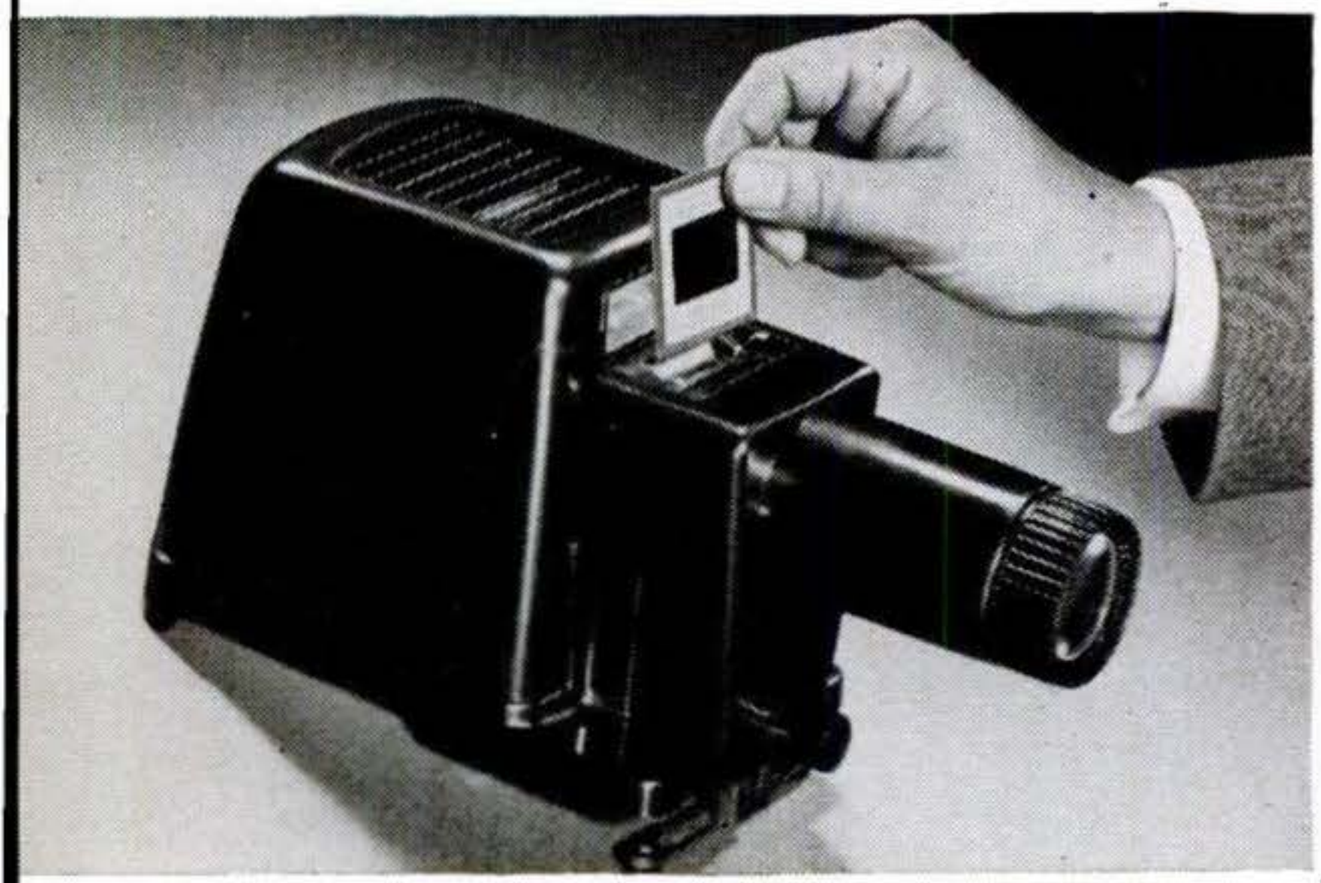
Copyrighted material

Color ... one of the biggest thrills of all



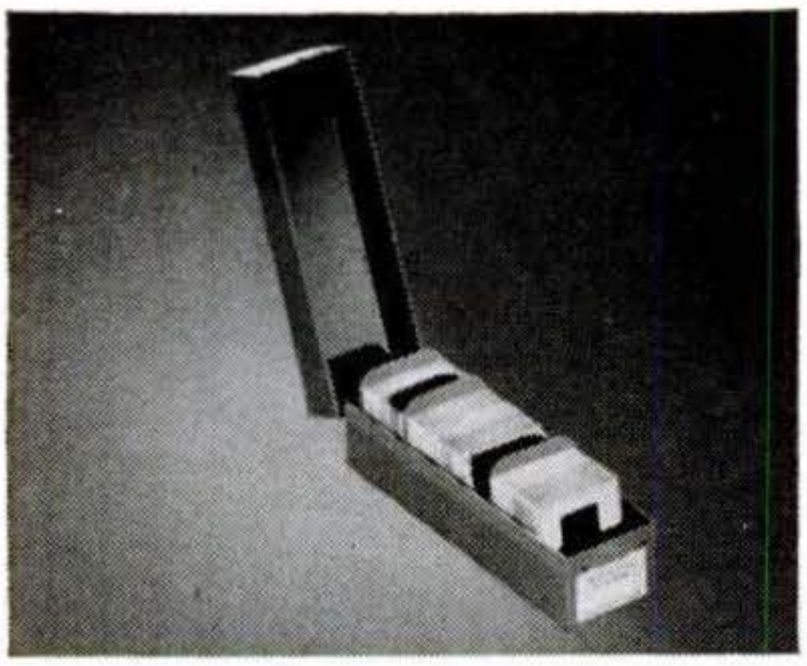
The beautiful projected image in full color is one of the most satisfying rewards of taking pictures with Kodachrome Film. Here you see some of the latest Kodak equipment and accessories for projecting, viewing, and storing Kodachrome slides.

Your dealer's experience and advice can prove invaluable. Don't hesitate to ask him questions. Answering them is his business. Enjoy one of the biggest thrills of all in photography—*pictures in color!* See your Kodak dealer today.

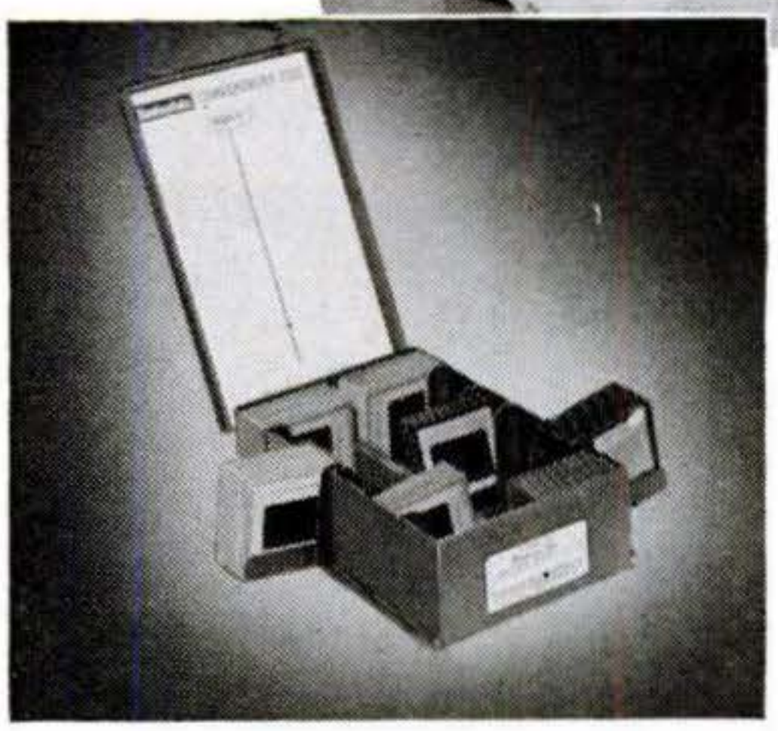


New, low-priced slide projector—Kodaslide Merit Projector is big news because of its new, improved slide-feeding mechanism. You simply insert slides in *top* of projector—thus no jarring or moving of instrument. Cool, large-sized lamphouse of unique design to keep slides flat . . . built-in elevating mechanism . . . Lumenized Kodak Projection Ektanon Lens, 5-inch *f*/3.5 . . . powerful 150-watt lamp . . . *all add up to real value for only $24.50.*

For convenient showings to small groups—Kodaslide Table Viewer, 4X, combines projector and screen in one unit. Think of the convenience—a complete show right in front of you—no rearranging of furniture, no dimming of lights. Switch it on and you're ready for a color show. You see your color slides beautifully enlarged more than 4 times. $49.50. Accessory carrying case at a small extra charge.



Keep slides protected, organized—Kodaslide File Box is a sturdy metal box that holds 150 cardboard slides or 55 glass slides. Separators for group filing. $1.50.



12 swing-out compartments in the de luxe Kodaslide Compartment File hold 240 cardboard or 96 glass slides. You'll like the handy index inside the cover for listing slides by subject. $3.75.

Prices subject to change without notice and include Federal Tax where applicable. Consult your dealer.

EASTMAN KODAK COMPANY, ROCHESTER 4, N. Y.

Kodak
TRADE-MARK

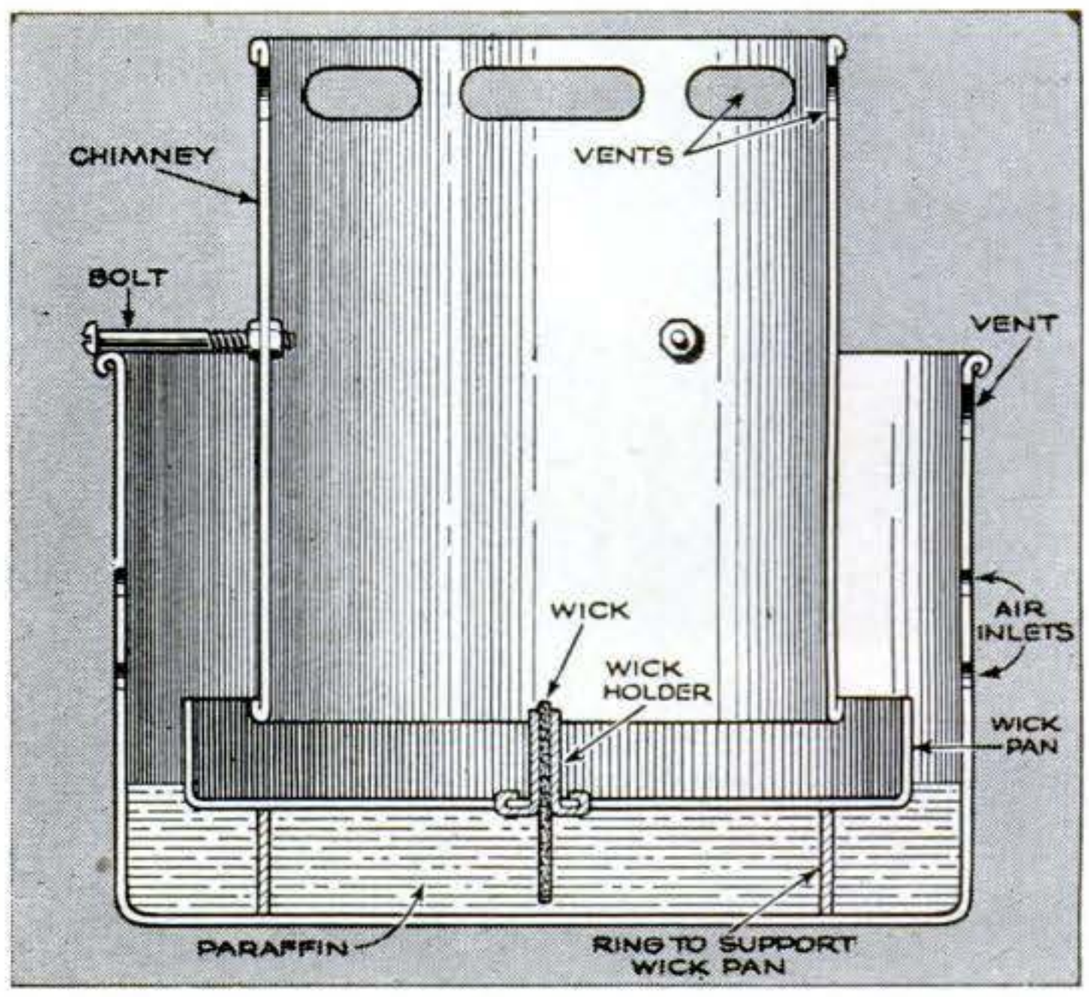
Stove (tin cup) and chimney (tin can) have ventilating holes punched in them. Arm bolts on chimney let it rest on sides of stove. For greater heat output, two wicks can be used.

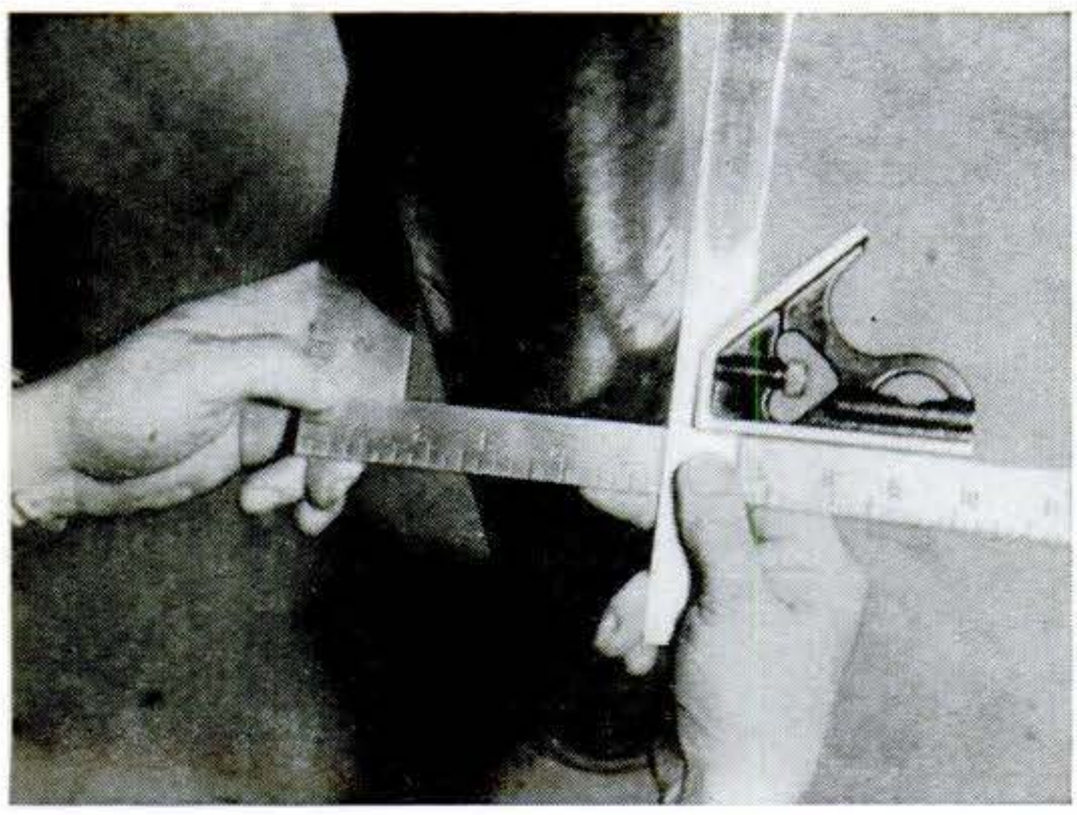
Camp Stove Burns Solid Fuel

You're not likely to spill the fuel out of this stove when you take it camping—it burns paraffin, a solid except when burning.

Made mostly from a large tin cup and a tin can open at both ends, the stove is easy to build. Details are shown in the photos and drawing.

The wick pan is a coffee-can lid to which the wick holder can be soldered or attached by tabs that are clinched in slits. Use a piece of folded asbestos paper for a wick. It should extend below the holder, almost to the bottom of the fuel reservoir. When the stove is cold, light it upside down.—*Walter E. Burton, Akron.*





Squares Measure Big Pipe

It's sometimes necessary to measure pipe that's too large for average calipers and that's installed so it can't be measured across the end. The problem can be solved by using a small carpenter's square and a combination square. Used as shown, the two squares give an o.d. measurement accurate enough for most purposes.—*Will Thomas, Buffalo.*

Peach Basket Dries Brushes

To drain and dry my paint brushes after I clean them, I just poke the handles through the gaps in a peach basket. It works fine.—*H. Graeter, Blairstown, N. J.*

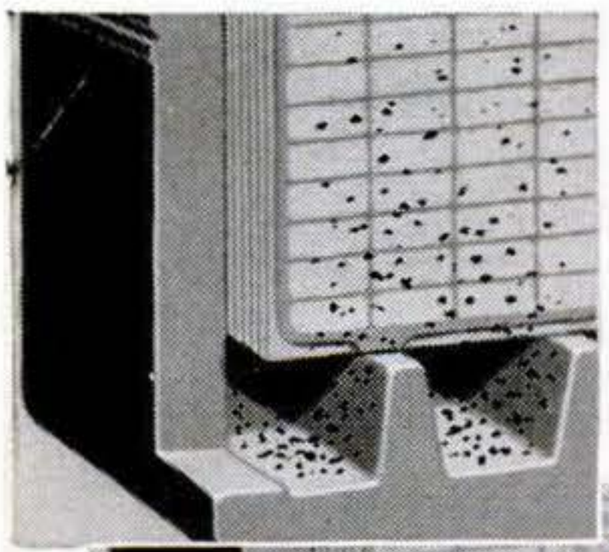
Joining Separated Mercury

If a thermometer is severely jarred or jolted, the mercury column sometimes separates, affecting the temperature readings.

The column can be joined again by cooling the thermometer with dry ice until the mercury has contracted into the bulb. Apply the dry ice slowly at intervals to prevent the mercury from freezing in the tube before reaching the bulb. Now allow the thermometer to warm slowly in a vertical position so that no gas is trapped in the bulb as the mercury expands.

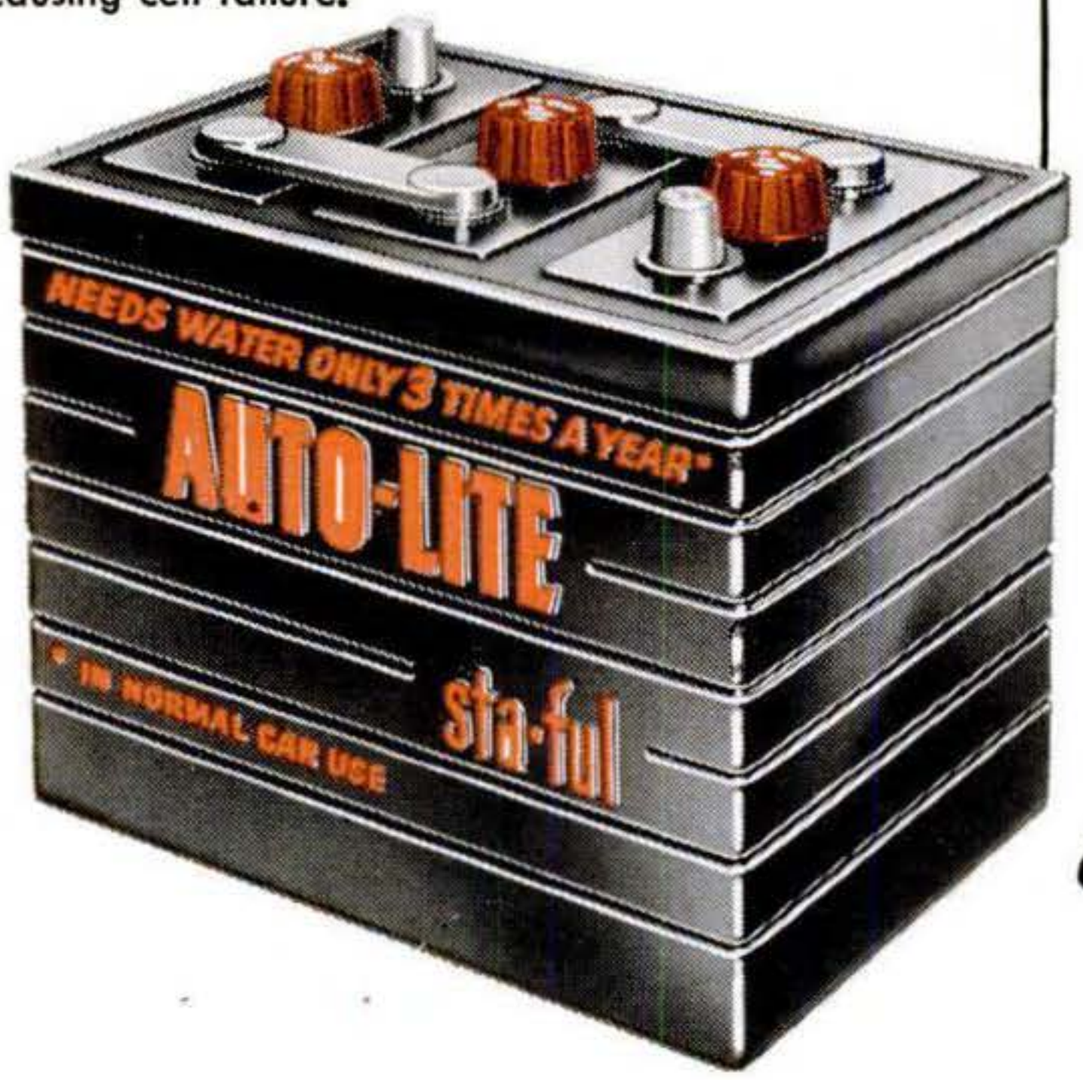
Copyrighted material

The inside story of your battery- See how it works!

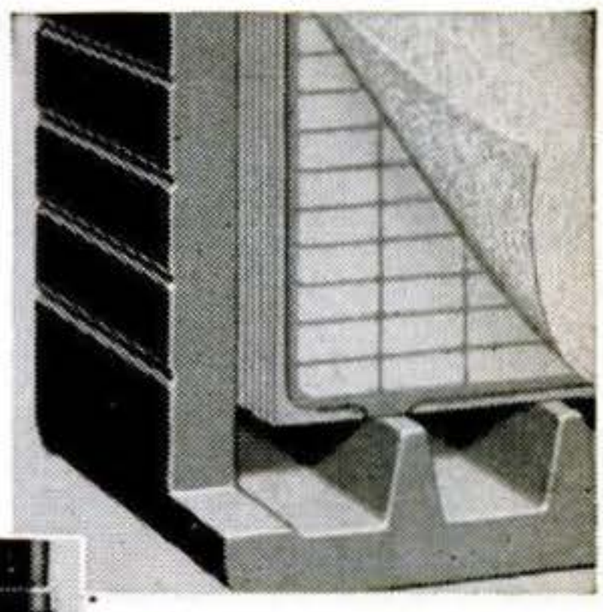


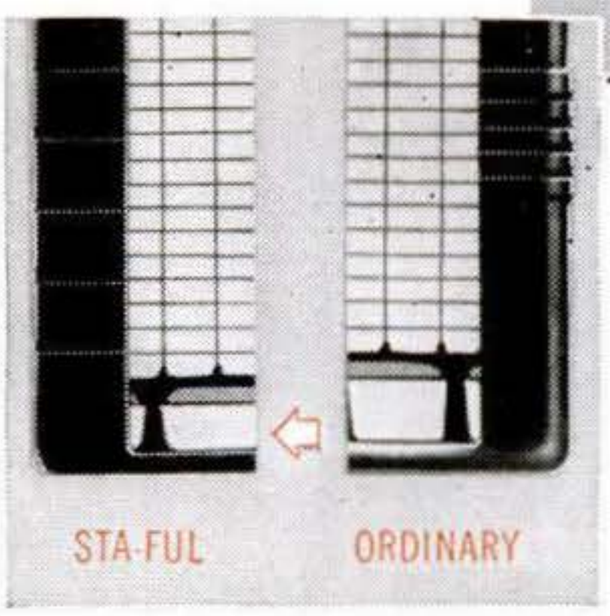
1 In ordinary batteries, small particles keep flaking off positive plates, so ordinary design batteries must have large sediment wells at bottom of case to hold these particles.

2 If sediment wells in ordinary design batteries aren't big enough to hold flaking particles from positive cells, particles pile up and short circuit cells, causing cell failure.

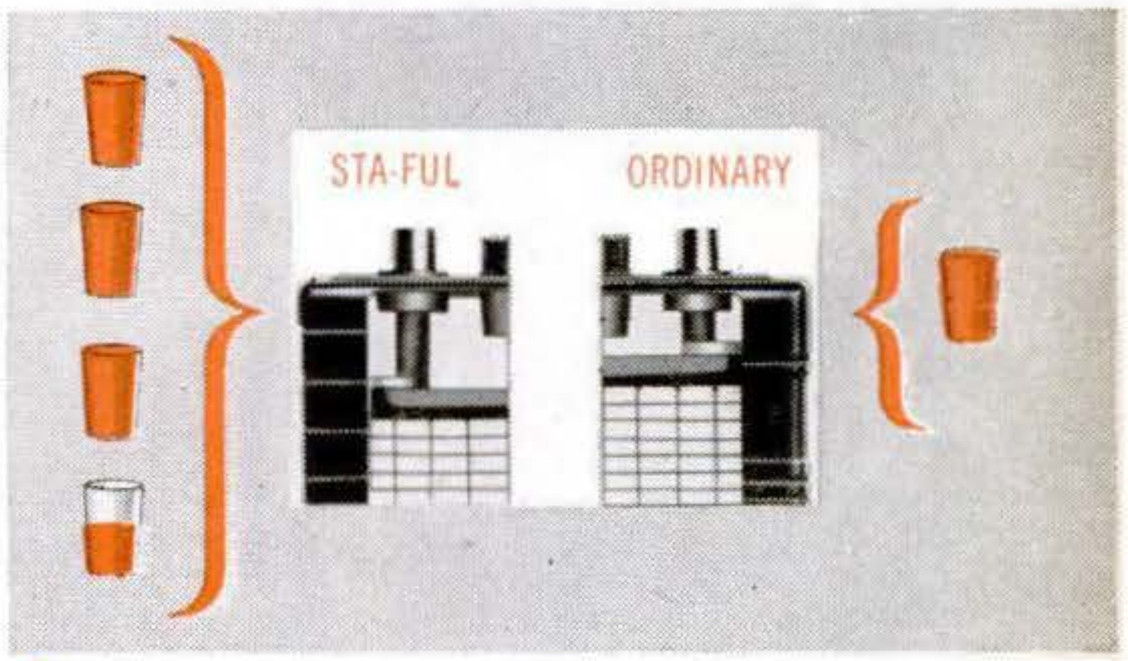


3 In the Auto-Lite "Sta-ful" Battery, every positive plate has a Fibreglass retaining mat protecting it and holding the active materials in place to reduce shedding and flaking.





4 Side-by-side view shows that the "Sta-ful" Battery doesn't need all the extra space at bottom as ordinary design batteries do. So extra space in "Sta-ful" Battery is moved to top where . . .



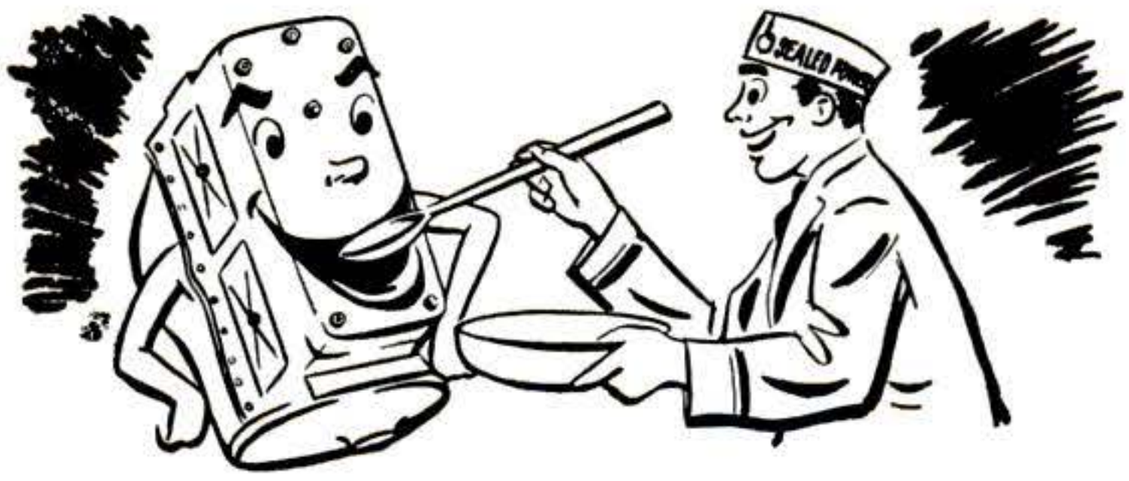
5 . . . extra space can be used to hold more battery electrolyte, giving room for over 3 *times the liquid reserve* in the "Sta-ful" as in ordinary batteries. That's why the "Sta-ful" needs water only 3 times a year in normal car use. "Sta-ful" Batteries give longer life, too, in tests conducted according to minimum life cycle standards.

AUTO-LITE BATTERY CORPORATION
Toledo 1 Ohio

Auto-lite sta-ful *...needs water only 3 times a year*

IN NORMAL CAR USE

Copyrighted material



Care and Feeding of Engines

BY S. P. CORP

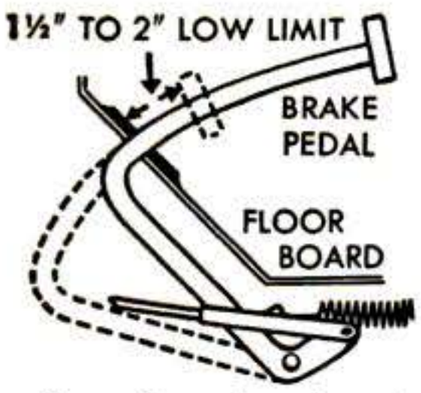
WHEN BRAKES DON'T BRAKE

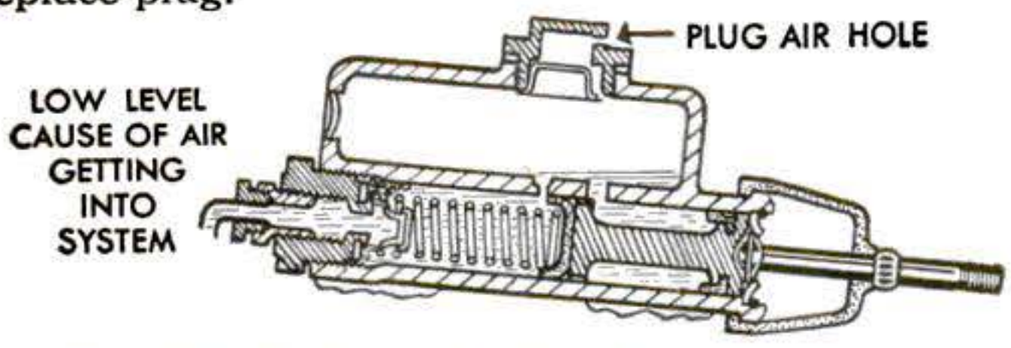
You're rolling merrily along. There's a stop sign ahead, for a main highway. You put your foot on the brakes. Nothing happens. For a few sickening seconds you go along with your heart in your mouth. You pray there isn't a car coming. There isn't. But there might just as well have been.

To keep this from happening, check your brakes often. Watch the position of the brake pedal when you stop quickly. If the under side of the pedal is less than 1½ to 2 inches from the floor, your brakes need adjusting. If you have to "pump brakes" to stop, your brakes need adjusting. Adjust the shoe of each brake.

AIR IN SYSTEM

Even after brakes are adjusted, you may have stopping trouble. If the pedal feels spongy or soft as you step on it, you probably have air in the hydraulic system. Check for air in the system by applying the brake with the car stopped. Hold the pedal down for a few seconds, then apply a little more pressure. If it moves down again, or feels spongy, you have air in the system, which must be removed by a bleeding operation at any good service station. Air gets in when brake fluid gets too low in the master cylinder. Check this level often, by cleaning top of cylinder and removing plug. If fluid is lower than ½ inch below top of cylinder, add fluid. See that air hole in plug is clean, then replace plug.





IF YOUR CAR SMOKES TOO MUCH

A smoking exhaust means your engine is wasting gas and oil, and needs new Sealed Power Piston Rings. The Sealed Power MD-50 is the best steel oil ring ever made. It controls oil even in badly tapered and out-of-round bores. Your dealer has Sealed Power Rings or can get them for you. A postal to Sealed Power, Dept. H-10, Muskegon, Mich., will bring you free helpful book, "7 Ways to Save Oil."

He Turned a Hobby into Big Business

[*Continued from page 133*]

In July 1934, Leo and Carrie moved into the building at Fifth Avenue and 42nd St. where Zeiss had their U. S. headquarters. By this time Leo's brother Si had joined the organization. Extra care was still the secret of the Pavelles' growing success—the only one, really—but the discriminating camera shops in the greater New York area were beginning to know about it. Several of the largest began sending all their fine work to 16 East 42nd St. (where Pavelle Laboratories, Inc., still are located).

Tint Trade-Marks His Work

Leo had always tinkered with the enlargers, redesigning and rebuilding them in his own machine shop—installing high-intensity quartz mercury lights to obtain 20- to 30-diameter enlargements in a matter of seconds, adding devices for removing dust from films, experimenting with new light sources. Also, to protect himself against occasional accusations of poor work that he had not done, he introduced into the fixing bath a blue-green dye about the hue of his serious eyes. This faint tint became his trade-mark, and still distinguishes his work.

World War II brought the Pavelles a new kind of problem. The United States government suddenly wanted 8 by 10 prints on the order of 15,000 to 20,000 a day. For example, the hush-hush Office of Strategic Services had an exacting job: it had requested citizens of the U. S., its allies and friendly neutrals to send in personal snapshots taken in any of the European, African or Asiatic areas where OSS was or expected to be operating—and many of these had to be copied and retouched to make them at all useful.

How to Make Good Enlargements Fast

The problem became one of fast quantity production with uniform high quality. Pavelle shut himself in his machine shop and came up with photoelectric cells to time the exposures for uniform results, and controls that determined exposure, relative accent on subject and background, and other variables. That development eventually led to exposure on 250-foot rolls of sensitized material and the first continuous black-and-white equipment that carried the exposed rolls on tandem, friction-braked rollers through the various baths and washes to the

[*Continued on page 246*]

If You Own a PONTIAC...

AC Spark Plugs, with patented CORALOX Insulator, Were Engineered Especially for You

For many years, Pontiac engineers have looked to AC for spark plugs which perform perfectly in Pontiac six- and eight-cylinder engines, under all operating conditions.

Naturally, the plugs they specify for all Pontiac engines are the newest AC Spark Plugs, with patented *CORALOX* Insulator.

***CORALOX* contributes to driving pleasure by making spark plugs perform better and live longer. It greatly resists fouling. Consequently, it ensures easier starting and surer firing, whether the engine is hot or cold.**

***CORALOX* brings these advantages to owners of *all* Pontiac cars, past models as well as present.**

AC Spark Plugs, with patented *CORALOX* Insulator, are therefore the logical replacement plugs for all Pontiac owners who want the utmost in spark plug performance.

IF YOUR CAR ISN'T A PONTIAC

you can also have the superior performance ensured by CORALOX. AC's immense engineering staff has worked with the engineers of most engines built in America. Therefore, there is an AC Spark Plug type, with patented CORALOX Insulator, engineered for your engine, too.

AC SPARK PLUG DIVISION GENERAL MOTORS CORPORATION

Copyrighted material

OWN THE FINEST!

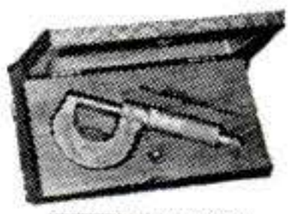
Starrett

SATIN CHROME* MICROMETERS

Pioneered and Developed by The L. S. Starrett Company

Often imitated, never equaled, Starrett Micrometers are the standard by which all others are judged. Precision made throughout by Starrett methods based on over 70 years of micrometer manufacturing know-how . . . plus 12 big features for better, faster precision measuring. Ask your distributor to show you these finest micrometers ever to carry the Starrett name.

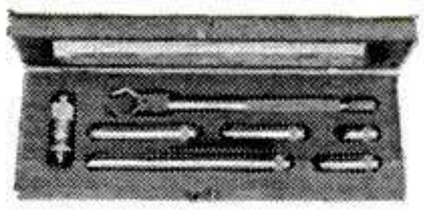
* No-glare, rust resisting *Satin Chrome Finish* is standard on thimble and sleeve of all Starrett micrometers and also on frame of all full finish micrometers.

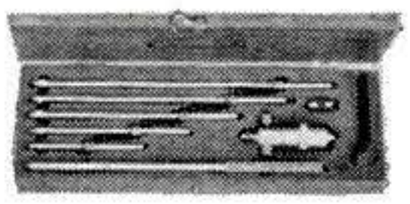


SATIN CHROME MICROMETER NO. 230
Range 0-1" by .001". Also available as No. 231 reading by .0001".

BLACK FRAME MICROMETER NO. 436
24 sizes from 1 to 24". Available singly or in sets with .001" or .0001" graduations.

INTERCHANGEABLE ANVIL MICROMETERS NO. 224
Ranges 0-4, 2-6, 6-9, 6-12, 9-12, 12-16, 16-20 and 20-24 by .001". Singly or in sets.





SATIN CHROME INSIDE MICROMETERS
With hardened and ground contact surfaces. Capacities up to 32".

NO. 823 with tubular rods.

NO. 124 with solid rods.

SEND FOR IT — ONLY 10¢
Starrett "Tools and Rules" Book
50 page booklet shows the right tools for any precision measuring job. 100 pictures plus helpful reference tables. Send only one dime. Address Dept. PS

THE L. S. STARRETT COMPANY • ATHOL, MASS., U.S.A.

TRADE MARK Starrett REG U S PAT OFF
STARRETT TOOLS
SINCE 1880
WORLD'S GREATEST TOOLMAKERS

BUY THROUGH YOUR DISTRIBUTOR MECHANICS' HAND MEASURING TOOLS AND PRECISION INSTRUMENTS · DIAL INDICATORS · STEEL TAPES PRECISION GROUND FLAT STOCK · HACKSAWS, BAND SAWS and BAND KNIVES

He Turned a Hobby into Big Business

[*Continued from page 244*]

cutting table. By 1943, assembly-line black-and-white photofinishing of hand-finished quality was an accomplished fact.

But events never give Leo Pavelle very lengthy breathers. In March 1944, Ansco introduced Printon, a sensitized material on which positive-transparency color film could be printed. Pavelle spent a week in Binghamton, N. Y., poking his opportunity-conscious Roman nose into every detail of the Ansco plant. He came back fully persuaded that Pavelle's brightest future was in color. But it was easier said than done, for the momentous step involved, among other things, new machines and new capital.

New Goal: 20,000 Color Prints a Day

The machines represented the greatest challenge Pavelle the engineer had ever taken on. Again, he disappeared in his machine shop. He knew that he would require two basic devices: one, a printing machine adapted to printing color transparencies by projection on long rolls of Ansco color Printon (exposures to be critical and automatically controlled, and the light source kept constant in color quality); another, a color-processing machine to carry the Printon through developing tanks, washers, driers, etc., under rigidly controlled conditions.

One year later, Pavelle Color, Inc., started producing in its huge $600,000 plant near the Hudson River on West 57th St. Into it had gone all of the Pavelles' money. But today, 175 employees (100 more probably will be added by the end of 1951) turn out as many as 20,000 color prints a day, exposing them on the new 1,000-an-hour capacity machines that feature, in addition to the photoelectric regulators and hand-operated knobs, yellow, cyan and magenta filter-wheels that offer 2,000 different combinations selected by an automatic color analyzer. Processing is done in a 120-foot room—at a temperature of 72° maintained by a special air-conditioning system that allows but one-tenth of a degree tolerance.

New Color-Negative Process Next

Teamed with Ansco, the man who makes shutterbug beginners look like pros is currently shooting for a fat share of the nation's color-picture printing. Ahead lies Plenacolor —Ansco's negative-transparency answer to

[*Continued on page 250*]

The POPULAR Line of Portable Power Tools

PET TOOLS

For Better Work... Easier and Quicker

Have Hundreds of Uses Around the Home In the Shop • On the Farm

Embodied in every PET portable electric tool and accessory is the excellence and value developed through advanced engineering, modern streamline design, economical manufacturing methods, and the specialization in high-quality electric tools. Each represents the finest precision workmanship and quality features that contribute to dependable performance, trouble-free service, and a new balance and ease in tool handling. The various accessories available for use with PET portable electric tools have been tested and proved in the applications recommended. They conveniently extend the use of this portable power to a variety of jobs that make for **easier and better work around the home, in the shop, and on the farm.**

You can buy a PET portable electric tool from your dealer with the full confidence of getting the ultimate in the combination of economy, power, light weight, balance, operating convenience, and long life of trouble-free service. Use coupon for complete details.

ZEPHYR

¼″ Drill

Full ¼″ Capacity
Lock-Type Trigger Switch
Palm Grip
Price $17.95

ZEPHYR

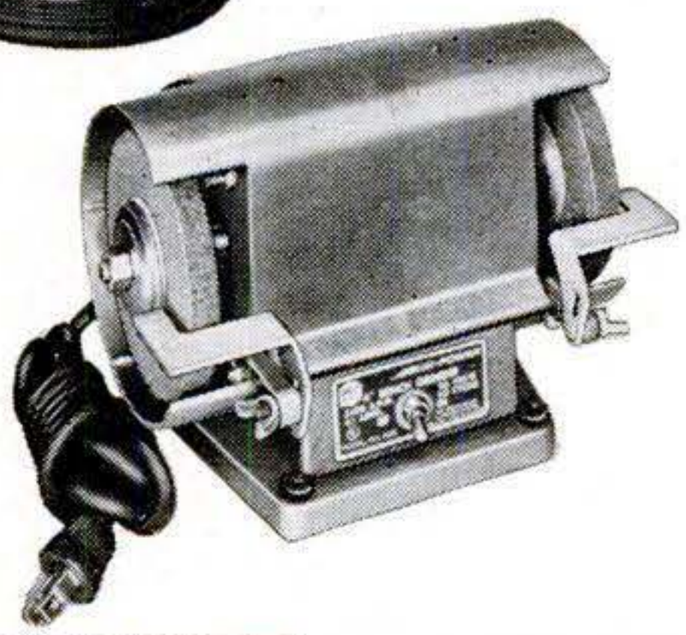
Spraymaster Portable Spray Outfit

For Paint, Lacquer, Enamels, Mothproofing Solutions, Etc.
Price $24.95

ZEPHYR

½″ Drill

Streamline Design
Removable Side Handle.
Price $31.15



***HI-POWER* Bench Grinder**

4″ Diameter Wheels, 3500 RPM.
Price $18.95

ZEPHYR

Electric Hand Saw

Maximum Depth of Cut 2⅛″. Adjustable for Depth and Angle of Cut. **Price $41.95**

PET TOOLS

At Hardware, Implement, and Building Materials Dealers, and Department Stores —Or Write Direct

PORTABLE ELECTRIC TOOLS, INC.

326 West 83rd St., Chicago 20, Ill.

In Canada: Portable Electric Tools, Ltd., 369 Danforth Road, Toronto 13, Ontario.

Portable Electric Tools, Inc.
326 West 83rd Street, Chicago 20, Illinois

Please send me your new PET tool catalog and name of nearest dealer.

*Name*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

Send Coupon Today for Full Information

Copyrighted material

"Shopsmith saved me $100

on this modern 17" television set"

"I built my own TV set. Seventeen-inch tube. Assembled chassis. Birch veneer cabinet. Modern design. The cabinet materials cost me $34.50. I figure I saved over $100. And I had the fun of doing it myself. What's more, it's just what I want in size, design and finish.

"On this job alone, SHOPSMITH saved half its own cost. I used it for everything—sawing, sanding, drilling and turning. It took me less than 60 seconds to change from tool to tool. In fact, I saved hours on jigs and adjustments, thanks to SHOPSMITH's time-saving features and precision settings.

"For accuracy, capacity, flexibility and all-around usefulness, you can't beat SHOPSMITH. It's a man-size tool, weighs over 200 pounds. Let me show you just a few of the things you can do with it."

SHOPSMITH is a *complete* power workshop . . .

- **8" circular saw**
- **12" disc sander**
- **33" wood lathe**
- **15" drill press**
- **Horizontal drill**

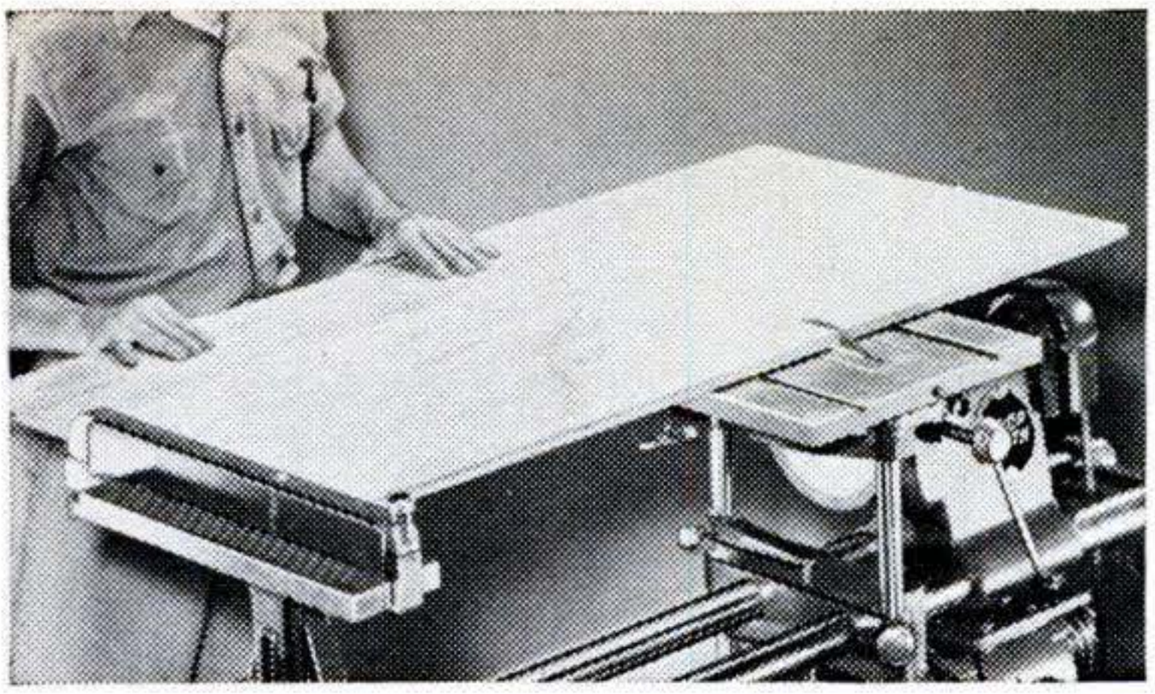
Five-tool unit complete except for motor*.. $189.50

***Special ½-hp., capacitor-type motor** $34.50

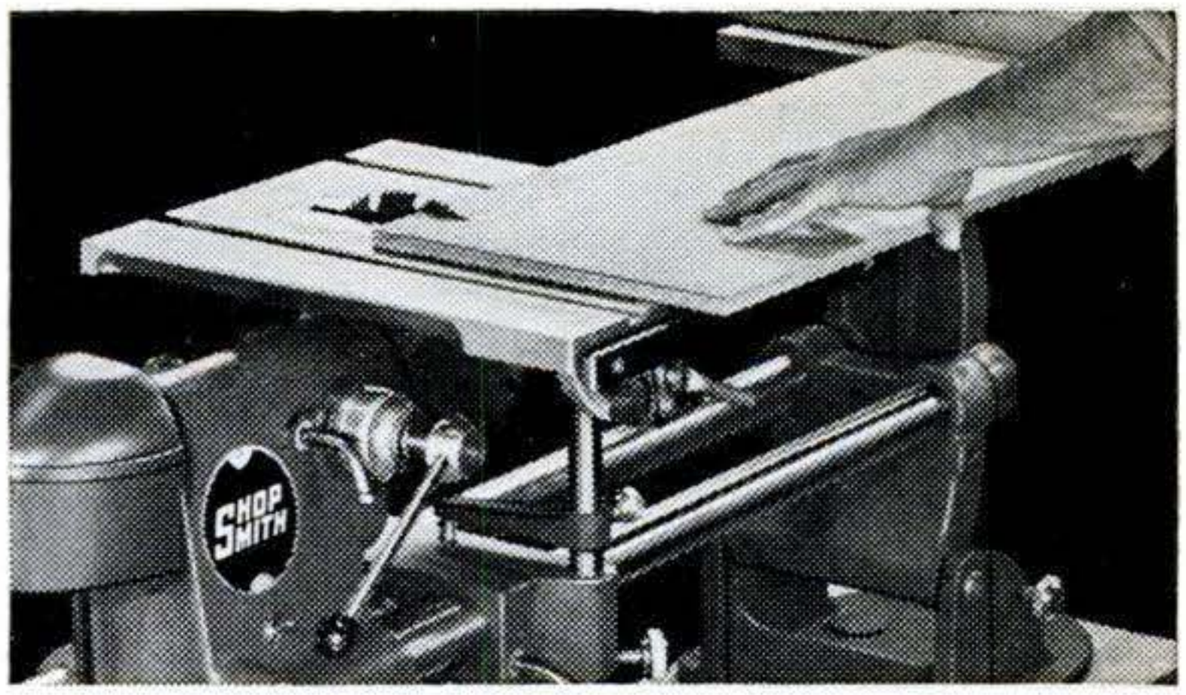
SHOP SMITH®

SEE SHOPSMITH DEMONSTRATED AT LEADING HARDWARE AND DEPARTMENT STORES OR ANY MONTGOMERY WARD STORE. WRITE FOR FREE CATALOG.

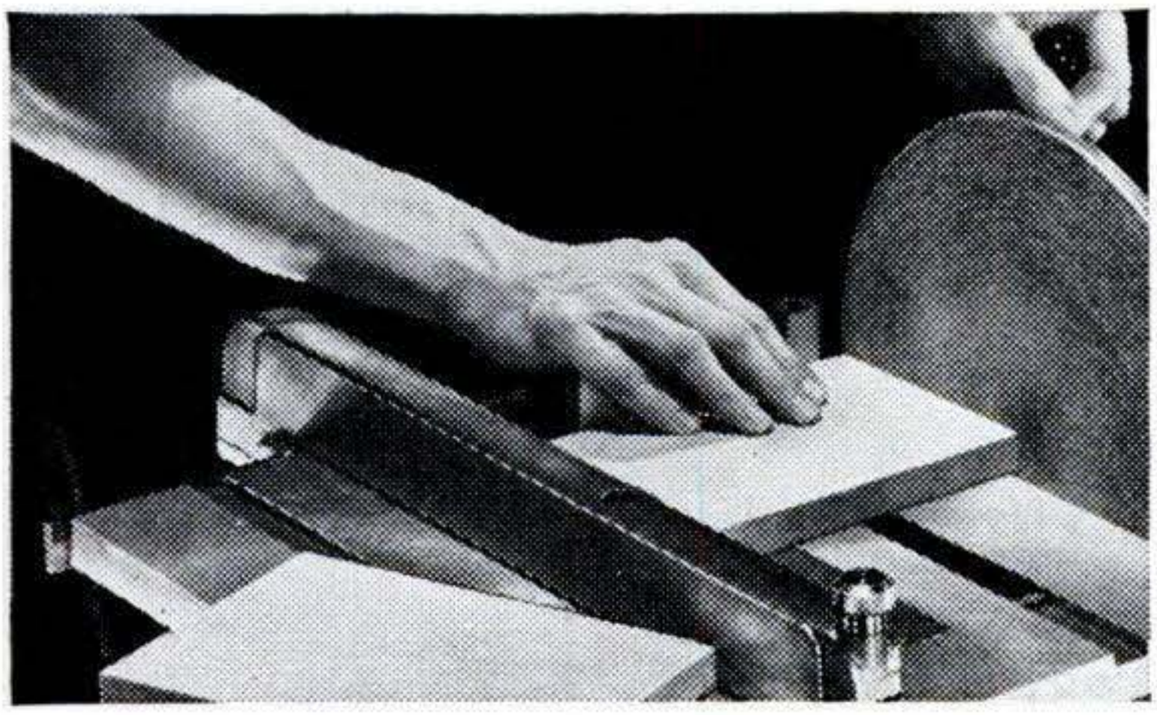
Copyrighted material



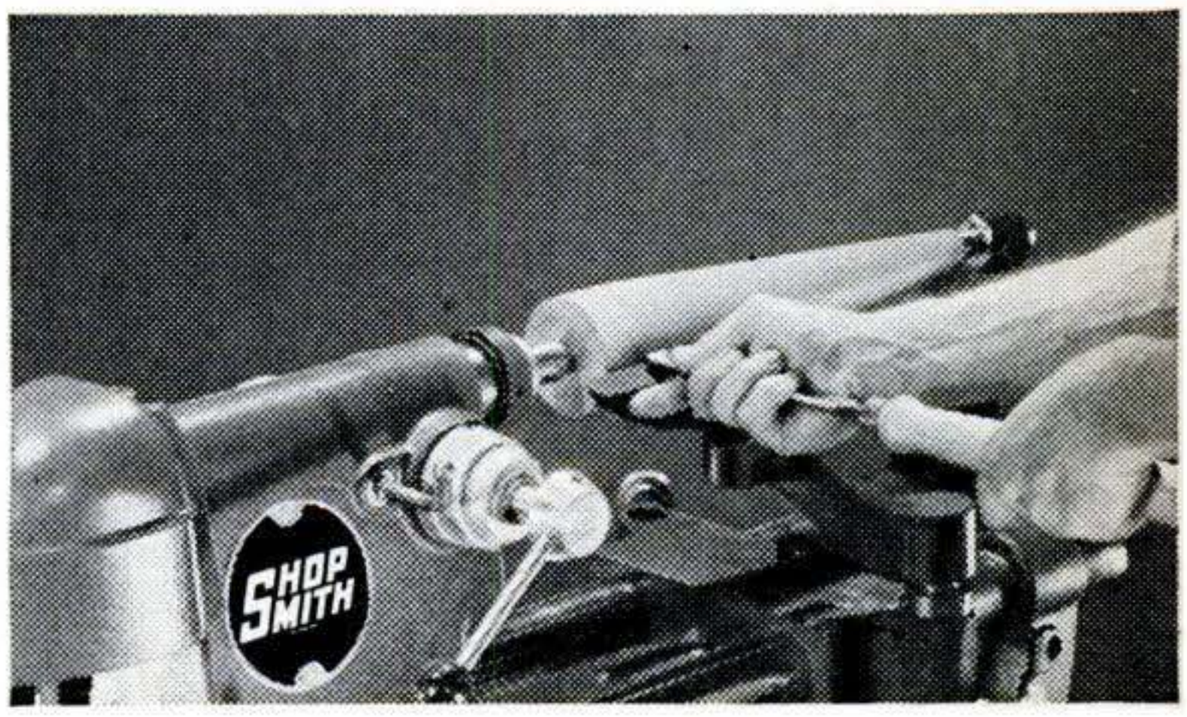
1 **"Sawing large panels.** SHOPSMITH has the capacity of a production-type saw. By putting the rip fence on the table extension, you get a maximum blade-to-fence distance of 48"—or right to the center of a standard size plywood panel."



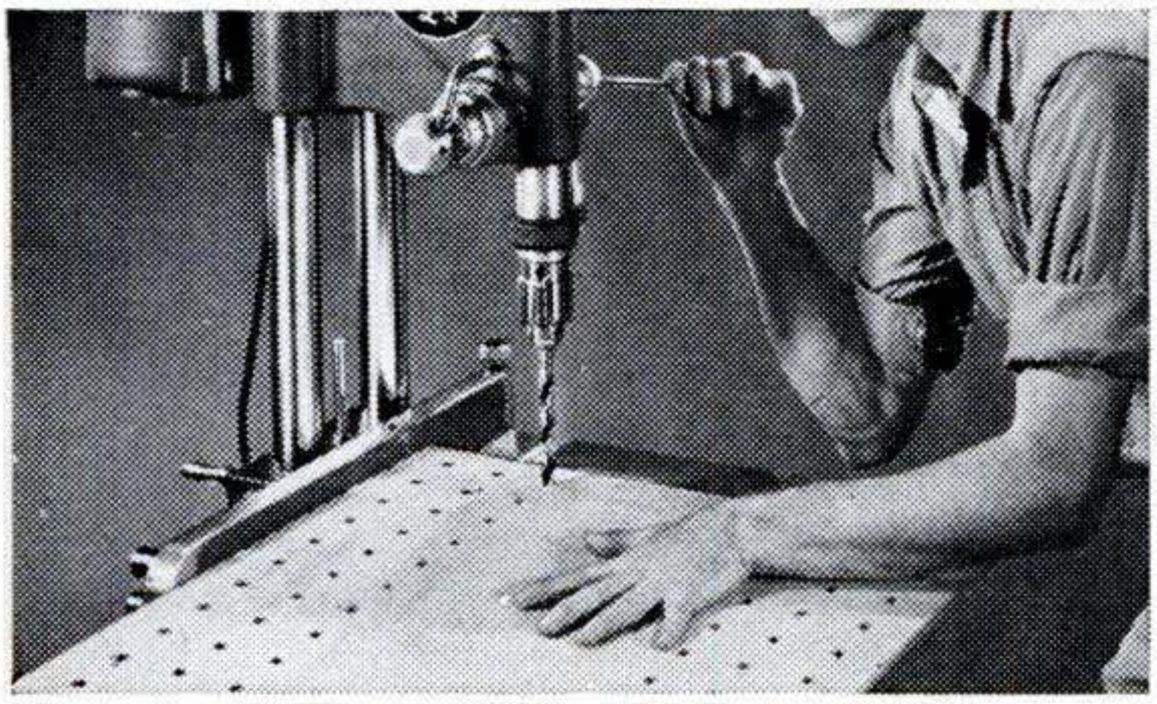
2 **"Accurate cuts** are easy with SHOPSMITH. Large miter gauge has automatic spring stops. Self-aligning fence has rugged front and back locks. For quick, accurate fence settings, the micro-quill adjustment makes hairline adjustments easy."



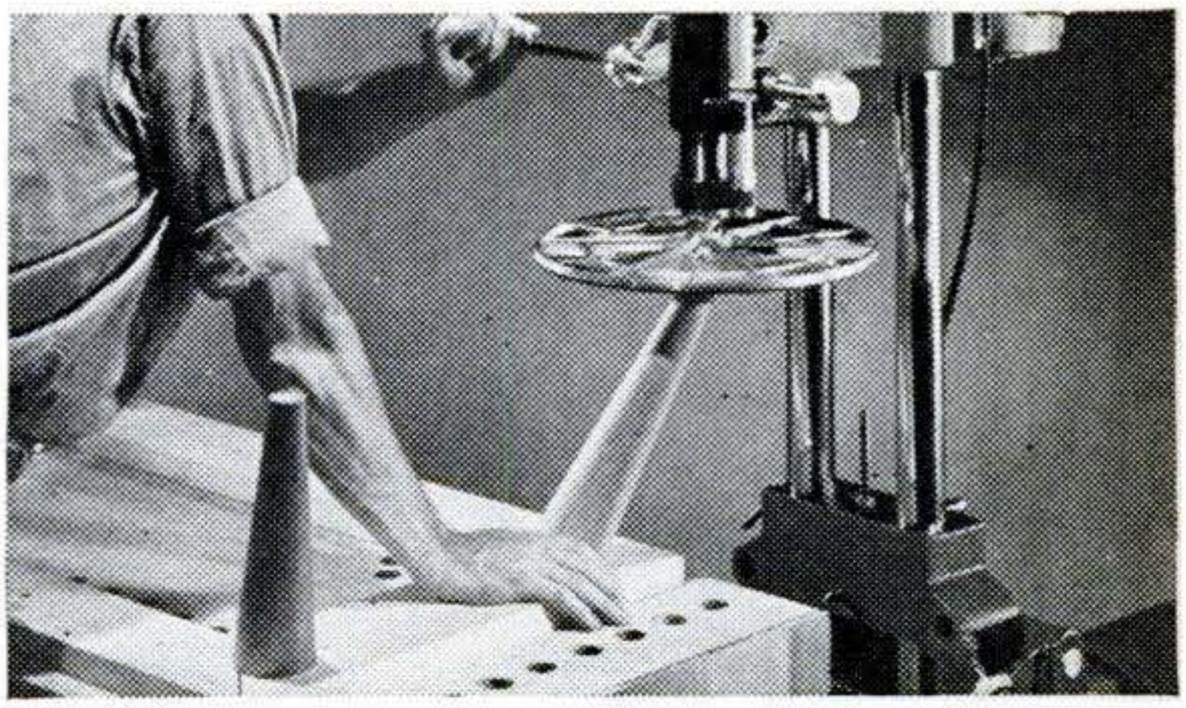
3 **"Duplicate sanding** is still another exclusive SHOPSMITH feature. You set up SHOPSMITH as a disc sander using fence and miter gauge as ready-made jigs. Set depth stop-nuts and feed disc into work. Pieces come out exactly the same length with precision-sanded ends."



4 **"It's a lathe, too!** Yes, SHOPSMITH is a heavy-duty wood lathe with 15" swing and 33" between centers. In turning pieces like the legs for my TV cabinet, the SHOPSMITH tool rest certainly proves its worth. Always slides parallel to work, and locks quickly, securely."



5 **"Parallel drilling** is another operation that's a cinch with SHOPSMITH. Rip fence serves as instant-set guide. Large table supports big work-pieces. Vertical drill press features 4" quill feed, 4 ball bearings in headstock, extra-big capacity."



6 **"Another SHOPSMITH extra.** To level legs of cabinet, I swung SHOPSMITH to vertical position, attached sanding disc and set depth stop-nuts. With workpiece upside down, I fed disc into each leg until it stopped. All legs were identical in length."

FREE! *16-page information-packed catalog. Gives full details and specifications on* SHOPSMITH *and accessories. Write for it.*

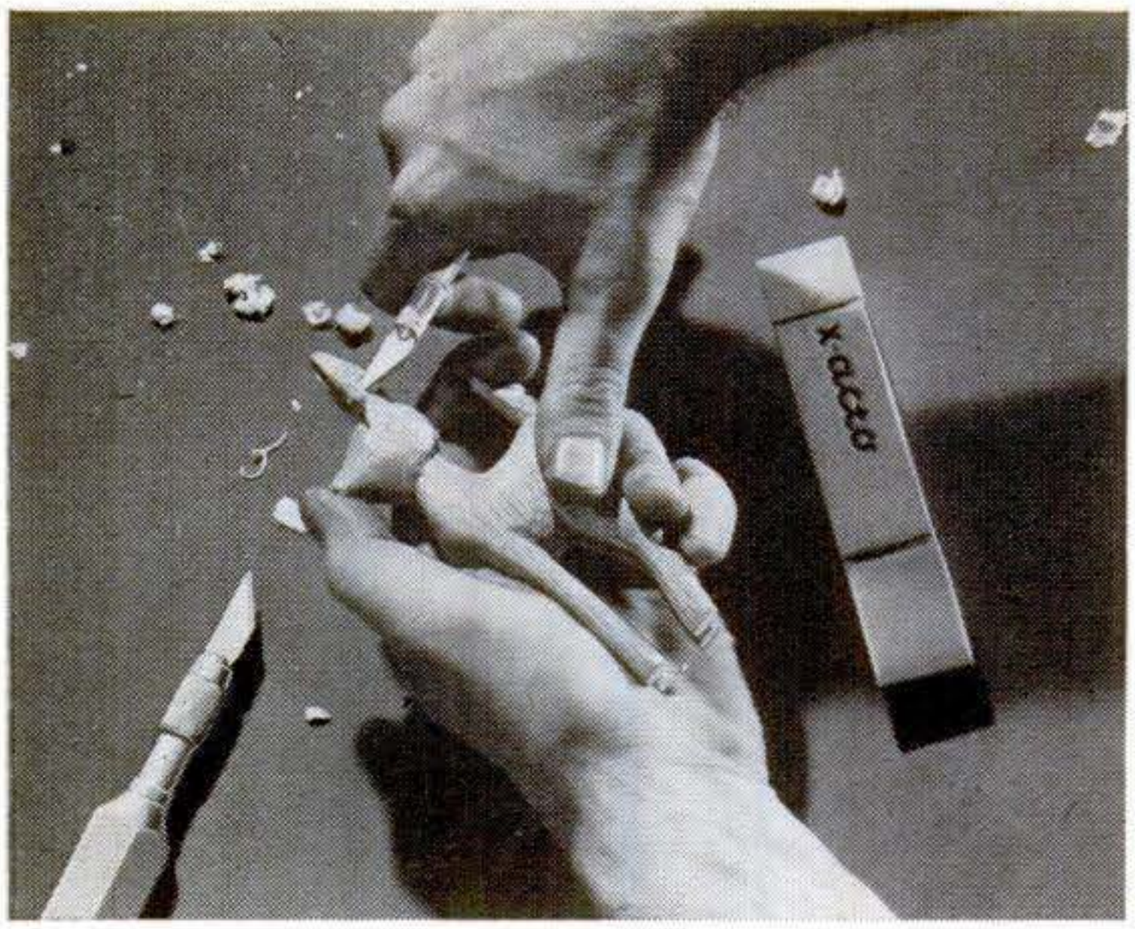
MAGNA ENGINEERING CORPORATION, Dept.177-A, ***at factory nearest you:***
12819 Coit Rd., Cleveland 8, Ohio, OR Menlo Park, California

Name_____

Address_____

City_____ State_____

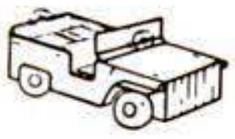
Copyrighted material



make your *HANDS MORE CREATIVE* with x-acto Knives and Tools

Creative hands can be your greatest asset . . . X-acto knives and tools help the intelligent coordination of active minds and agile fingers . . . they can develop skill and dexterity in any art or handicraft you select.

Whether it's boat whittling, model airplanes, wood-carving, leathercraft, model railroads or any other handicraft, you can make *your* hands *more* creative with "designed-for-the-job" precision-engineered X-acto knives, tools and handicraft kits.



X-acto offers *the* complete line of handicraft knives, interchangeable blades, tools and attractive kits.

From 25¢ to $30.—at dealers everywhere.

No. 82
X-ACTO KNIFE CHEST
$4.20

Send 15¢ to cover postage for our new illustrated 28-page Catalog.

X-acto Crescent Products Co., Inc.
440 Fourth Avenue, New York 16, New York

He Turned a Hobby into Big Business

[Continued from page 246]

Kodacolor—and Pavelle is going along for more than the ride. Recently released in test areas, and due for public distribution by 1952, Plenacolor is expected to claim its hunk of a traffic that may well approach 100,000,000 color snapshots a year before 1954.

If Leo Pavelle has any business worries he does not take them home to sons Arthur, 17, and Richard, 10. Neither does wife-partner-mother Carrie, whose black-and-white business employs 70 and is likewise about to add help.

"Mostly, I'm turning out gunstocks, or making fishing rods, or maybe tying flies or taking cameras apart—when I'm home," he says, the blue-green "trade-mark" eyes lighting up at the thought.

Just an Occasional Ride—at 120 M.P.H.

"He's a nut on sports-car racing too," an admiring assistant adds.

"Oh, I'm just a guy who likes an occasional ride in a fast job like the Jaguar," Pavelle says modestly.

"Yeah—at 120 miles an hour," the assistant mutters.

Anything else?

"Well, I'm going to teach a little next year. New course in photographic technology in the Graphics Division of the Engineering Department at Columbia. I'll handle the engineering aspects."

Wasn't he afraid of training too many rivals?

"Lord, no! We're interested in building the industry, not ourselves. We'll get our share." END

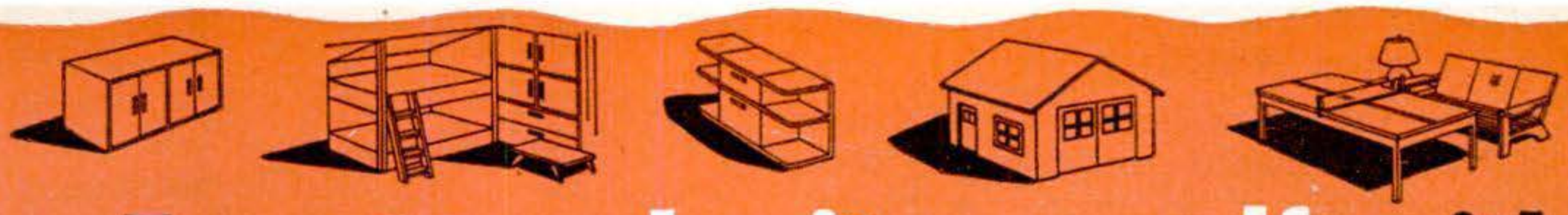
Baby Rattle Fit for a King

PROBABLY the world's most expensive rattle was the aluminum one bought for the son of Napoleon III. Its price in 1856, when aluminum was considered a precious metal, was $3,200.

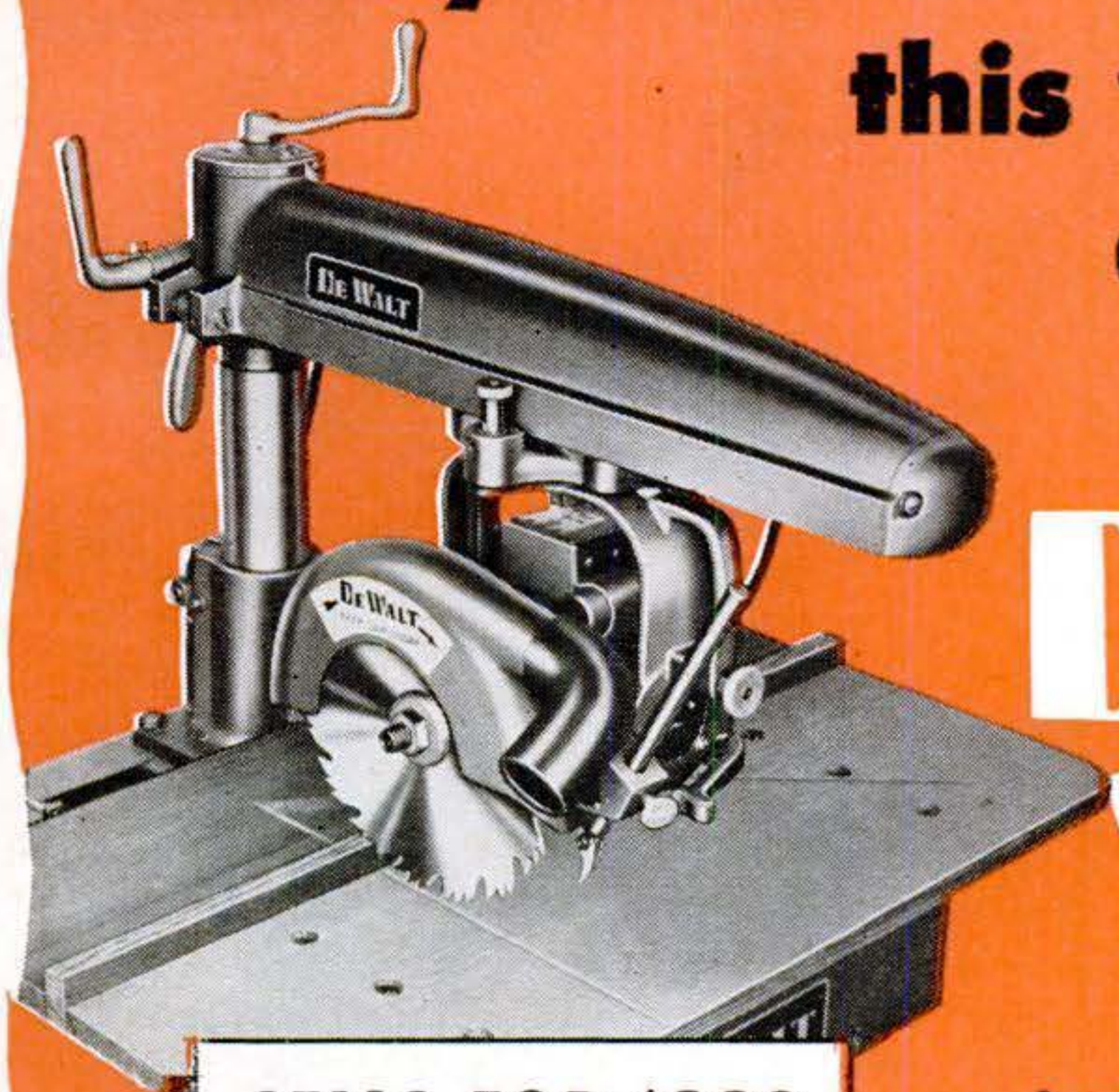
Sea Sound in Shell a Phony

THE sound of the "roaring sea" we hear when holding a sea shell to the ear is caused by resonance. The partly enclosed air within the shell is made to vibrate by a harmonious, or matching, frequency of sound in the outside air. In a soundproof room, a sea shell would produce no noise.

Copyrighted material



Easy to make it yourself with this versatile, all-purpose, low-cost DE WALT "power shop"

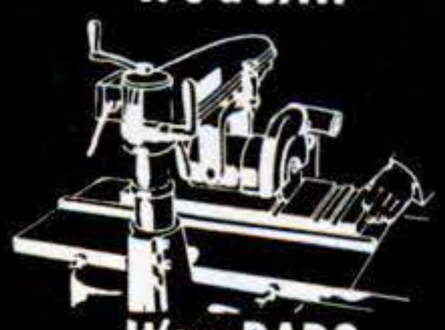


SELLS FOR $229
motor included

does everything in woodworking!

MANY MACHINES IN ONE!

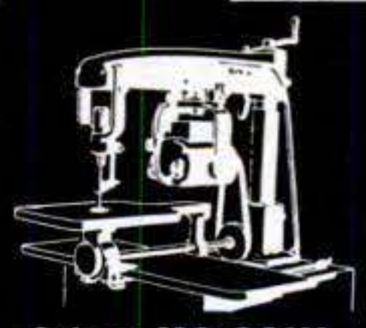
It's a SAW



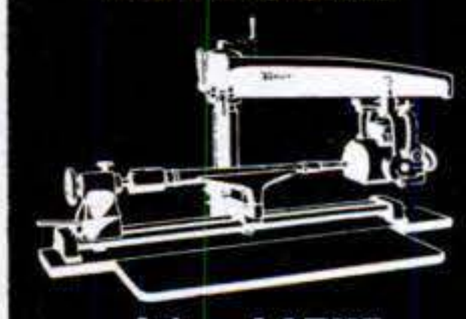
It's a DADO

It's a SHAPER

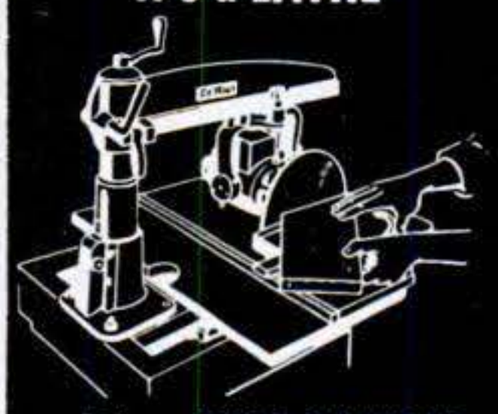
It's a ROUTER



It's a JIG SAW



It's a LATHE



It's a DISC SANDER

Here, in one compact, space-saving unit, is the ideal all-purpose machine for your home workshop.

DE WALT—world-famous radial power saw—works wonders with wood, metals or composition materials. It's super fast! It's super safe! In fact, it is so easy to operate and so flexible that with each quick change of a cutting tool, you have another precision machine. It's *many* machines in one!

Using this multi-purpose machine you can make *any* number of things with ease—cabinets, shelves, furniture, even a garage or an addition to your house!

Send for literature which describes what you can make—and the many different cutting operations you can achieve—with a DE WALT.

Send for Free Folder

DE WALT, INC.
Dept. PS-10, Fountain Ave., Lancaster, Penna.
Please send me descriptive literature on the DeWalt Power Shop.

Name.....

Address.....

City.....State.....

DE WALT INC.
A Subsidiary of American Machine & Foundry Co.

Copyrighted material

Can Makes Welding Shield

A STURDY and efficient welding shield can be made from an empty gallon can. Remove one side of the can, making the cut just a little beyond the seam so that the seam is retained to reinforce the edge. Fold over the cut edges and squeeze down tightly.

Cut a 1⅜″ hole in one end of the can. Roll up a 6″ length of the waste tin for a handle and solder the seam. Flatten and bend down one end. Push the round end through the hole from inside the can and solder tight where it enters the can and where the bent end meets the inside of the shield. Solder the screw cap to the end of the handle.

A smaller rectangular can, cut off ½″ above the bottom seam, forms the glass frame. Cut out some of the bottom to make an opening for the glass. Cut a hole of the same dimensions as the frame in the face of the shield, 3″ down from the top. Slit the four corners of the small can and put it through the shield. Hammer the edges over, inside the shield, and solder all around. Insert a piece of ordinary glass in the frame and then a

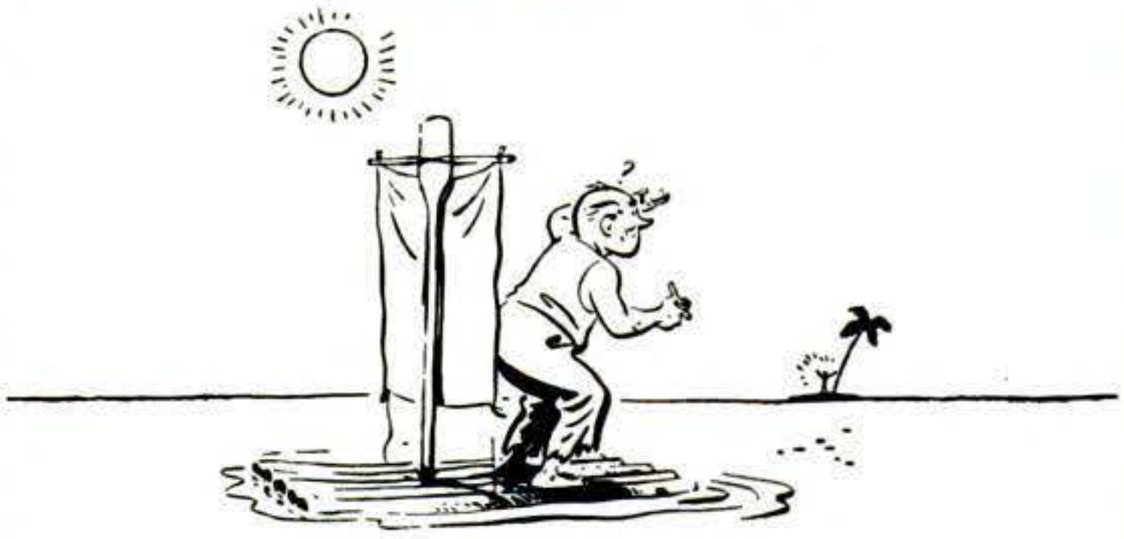
piece of welder's dark glass. Cut the glass retainer from the remaining waste tin, bend up the two tabs, and fasten them over the dark glass with 8-32 screws and the knurled nuts from a dry cell. Be sure there are no light leaks around the retainer. Wash off any soldering acid with washing-soda solution and paint the shield a dark color.

UNCLE WALTER

IT SMELLS GRAND

AROMA SWEET AS ANY ROSE—

IT PACKS RIGHT



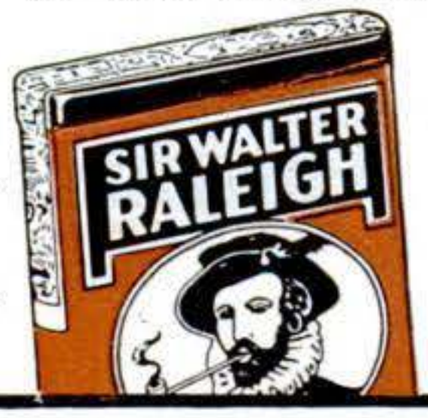
PACKS TO PLEASE YOU—
GOODNESS KNOWS!

IT SMOKES SWEET

WITH EVERY PUFF
YOUR PLEASURE GROWS!
-with Sir Walter Raleigh!

IT CAN'T BITE!

SIR WALTER RALEIGH'S BLEND OF CHOICE KENTUCKY BURLEYS IS EXTRA-AGED TO GUARD AGAINST TONGUE BITE, AND SIR WALTER RALEIGH NEVER LEAVES A SOGGY HEEL IN YOUR PIPE. STAYS LIT TO THE LAST PUFF.

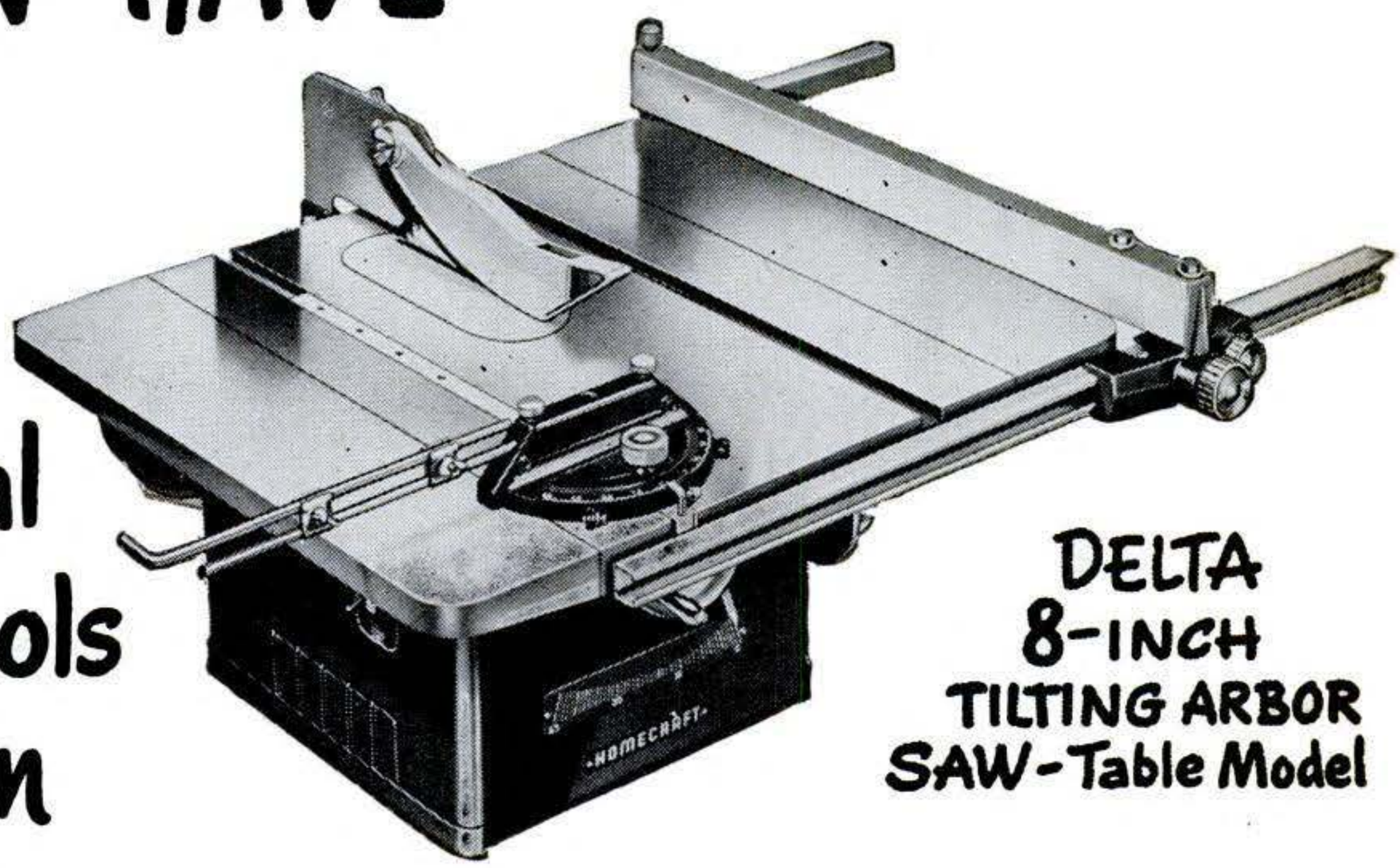


It costs no more to get the best!

Copyrighted material

YOU CAN HAVE

all the precision of industrial machine tools in your own home shop



DELTA 8-INCH TILTING ARBOR SAW-Table Model

Home shop work is a real joy when things come out according to plan . . . when cuts are true . . . joints fit snugly into place . . . drawers slide smoothly . . . all without the exasperating nuisance of refitting.

Of course, it takes precision machines to turn out accurate work. That's why smart folks buy Delta Homecraft Tools. For remember, Delta has spent years building the finest precision machine tools for industrial use. And the same accuracy and hair-line precision that is required for these Delta-Milwaukee Tools is built into the Homecraft Tools *you* buy. We just don't know how to build them any other way.

So . . . buy the best . . . buy Delta . . . have machine tool precision and lifetime service in your own home workshop.

There's a Delta Power Tool for Your Job-

WOOD OR METAL WORKING

53 MACHINES—246 MODELS—MORE THAN 1300 ACCESSORIES

For Delta Dealers, see your Classified Phone Directory under "Tools".

These Delta 8" Tilting-Arbor Saw Features INSURE ACCURACY AND PRECISION

1. **Lubricated-for-life ball bearings**—keep dirt out, lubricant in
2. **Precision-bored bearing seats**—fit close, cannot become loose
3. **Pre-loaded bearings**—eliminate arbor end-play
4. **Precision-ground arbor**—assures even contact between arbor and bearings, means greater accuracy
5. **Dynamically balanced pulleys**—prevent wear-producing vibration

These excellent features, typical of Delta precision quality, are fully described in the new Delta Homecraft Catalog—packed full of valuable information and suggestions on how to get the utmost of fun and satisfaction out of your home workshop and your Delta Homecraft Tools. Send for your copy—it's free. Use the coupon.

DELTA MILWAUKEE

DELTA POWER TOOL DIVISION

Rockwell

MANUFACTURING COMPANY

805L E. VIENNA AVENUE • MILWAUKEE 1, WIS.

Please send me the new Delta Homecraft Catalog.

Name_____

Address_____

City_____ Zone_____ State_____

Copyrighted material

YOU CAN TELL
A GOOD
ELECTRIC DRILL
BY ITS CHUCK

JACOBS

If it's a **JACOBS**
It bears the name... look for it!

Jacobs Rubber-Flex Hand-Tite Chuck. One-piece RUBBER-FLEX jaw assembly holds tools true and tight. No loose jaws or springs.

Jacobs Plain Bearing Key Chucks . . . the most widely used drill chuck in the world.

Jacobs Rubber-Flex Hex-Key Chucks on home workshop power tools prove that their makers put quality first.

IF IT'S A
JACOBS
IT HOLDS

The Jacobs Manufacturing Company
West Hartford 10, Connecticut

Gus and the Missing Straddle Truck

[Continued from page 198]

Thatch tell you about this straddle truck?"

Gus shook his head.

"Well, between you and me, I don't think there's anything wrong with it," explained Ned. "Runs fine for me, but every time Frank—he's the driver—takes her out for a day in the yard, he brings her back howlin' a blue streak and tellin' me that she's got a bad miss."

"What does he claim it does, start to miss after it's warmed up?" inquired Gus.

Engine Runs Fine

"No, he claims it begins to miss just as soon as he gets to pushing her at all. You know these straddles take a lot of punishment—lots of lugging and lots of idling every day."

"Mind if I have a look at the engine?" asked Gus.

"Help yourself," replied Ned. "I've got other work to do."

So as Gus climbed up on top of the straddle truck and opened the hood, Ned disappeared into his shop and presently Gus could hear the noisy hiss of an acetylene torch.

Gus's first hunch was fouled plugs caused by so much idling. However, when he took out several of the plugs he found them fairly clean. Replacing the plugs, he climbed around to the driver's seat, turned the ignition switch, and hit the starter button. The engine didn't catch immediately, but when it did it ran smoothly. Although he'd never driven a straddler before, he wheeled it around the space in front of the shop several times. He thought the engine sounded pretty good.

Now Engine Misses

Just at that point, Gus noticed a young man approaching the shop.

"You Mr. Wilson?" he called to Gus. "Mr. Thatch told me to see you. I'm the driver of that truck."

Gus flipped off the ignition. "Understand this animated doodlebug has been giving you trouble," he called down.

"You can say that again. Got a bad miss, but I can't convince this dumb mechanic of ours. Here, I'll show you." He climbed up, closed the hood and slid into the driver's seat. "We'll drive her up to the yard and pick up a few boards."

[Continued on page 256]

Copyrighted material

TOUGH..but oh so gentle

TOUGH ON OIL-PUMPING • GENTLE ON CYLINDER WALLS

When your car first starts using too much oil, look out for worn-out piston rings. They cause oil-pumping . . . loss of power . . . destructive engine wear.

Fortunately, it's comparatively easy and inexpensive to replace worn-out piston rings—but the more you delay, the more you pay.

At the first sign of oil-pumping, replace your rings with Hastings piston rings. They're engineered for *replacement* service. They *stop* oil-pumping, *check* cylinder wear, *restore* engine performance.

It's the best money you can spend on your car.

Keep your car out of the

DANGER ZONE

Ask your motor service man for a Danger Zone check-up. And write for the free Hastings Danger Zone booklet which shows you how to save money on engine repairs. Dept. P, Hastings Manufacturing Co., Hastings, Michigan. Hastings Ltd., Toronto.

HASTINGS

STEEL-VENT PISTON RINGS

PISTON RINGS • SPARK PLUGS • OIL FILTERS • CASITE • DROUT

Copyrighted material

New improved woodworking calculator

answers countless questions in seconds . . . speeds jobs!

Here's the *improved* GREENLEE Calculator with more information on lumber, nails, concrete mixes, painting materials, etc. Convenient . . . simple to read. Just set dial for nail specifications, to convert linear to board feet, find bit sizes for screws, compare characteristics of wood. 6" diameter, heavily varnished card-board, printed in three colors. Special offer by the makers of famous GREENLEE tools. **only 25¢**

No Stamps, Please!

TOOLS FOR CRAFTSMEN
GREENLEE

GREENLEE TOOL COMPANY, 2130 Columbia Avenue
ROCKFORD, ILLINOIS

☐ Enclosed is 25c. Send your "Handy Calculator" by return mail.

NAME.....

ADDRESS.....

CITY..... ZONE..... STATE.....

Gus and the Missing Straddle Truck

[Continued from page 254]

Even without a load, Gus could now detect a loss of power. "Mind if I drive?" he asked when they had reached the yard.

"Sure thing," said Frank.

Gus put the truck through its paces. There was no doubt about there being a bad miss every time he pushed hard on the gas.

"See what I mean, Mr. Wilson?" said Frank. "But that grease monkey we've got won't believe me, and he won't take the truck out himself and test it."

Gus Straddles a Straddle

Gus didn't answer. He was too busy trying to work out in his mind just why the engine missed now but hadn't missed before. Sliding out of the driver's seat, he opened the hood again and checked the distributor, the carburetor and the connections to the coil and the spark plugs. Everything checked out.

"Start her up, will you, Frank?" Gus called from beside the open hood.

Frank complied and again the engine took hold easily and purred along. For the next fifteen minutes, Gus peered under the open hood while Frank maneuvered the big straddle around the mill yard, picking up lumber, backing, idling, and gunning the engine.

Again there wasn't a hint of a miss. She was hitting on all six.

"Cut it," called Gus, and he just sat there staring at the temperamental engine. Suddenly he reached up and slowly closed the hood. Then he raised it, pulled it down and raised it again.

Ned Loses a Bet

"Humph," he said, digging into his left coverall pocket for his friction tape. Then he proceeded to wrap tape around the bundle of ignition wires that sprouted from the top of the distributor. "All right, now let's try her again."

This time the engine ran smoothly no matter what Frank did.

"That's got it," said Gus.

"What?" asked Frank.

"Come up here," said Gus. He pointed to a worn shiny spot on the underside of the hood. "The distributor wires were rubbing against the hood when it was closed. Pinprick leaks in the insulation were shorting

[Continued on page 258]

Copyrighted material

QUALITY CONTROLLED

MA·TI·CO ASPHALT TILE FLOORING

INSTALL MATICO YOURSELF for as little as 13¢* a sq. ft.

New, perfected MA·TI·CO® install-it-yourself METHOD makes anyone a floor craftsman

Mail Coupon for instruction booklet NOW!

Create exclusive designs from unlimited color combinations!

Beat high flooring costs! Install MATICO yourself! You can floor an entire room in only a few spare-time hours. MATICO offers everything you need — simplified instructions . . . special tool kit . . . and tile so outstanding in color richness, finish and durability that it is ideal for every room in your home.

Superior MATICO resists scuffs and mars . . . washes easily . . . gleams like new with occasional no-rub waxings . . . wears for years and years . . . and comes in 27 rich colors, including lovely pastel "Petal Tones." Colors and marbleization can't wear off — they go clear through each tile. Ask your dealer for details or mail coupon today!

**Your cost may be less, or slightly more, depending on where you live, and the colors you select.*

Guaranteed by Good Housekeeping — Replacement or a refund of money if not as advertised therein

MASTIC TILE CORP. OF AMERICA
Dept. S710, Box No. 986
Newburgh, N. Y.

Please send complete install-it-yourself instruction kit, illustrated literature and color charts. Enclosed is 10c for mailing.

NAME .....

ADDRESS .....

CITY..... ZONE.... STATE.....

QUALITY CONTROLLED MA·TI·CO ASPHALT TILE FLOORING

MASTIC TILE CORPORATION OF AMERICA

WORLD'S LARGEST PRODUCER OF ASPHALT TILE

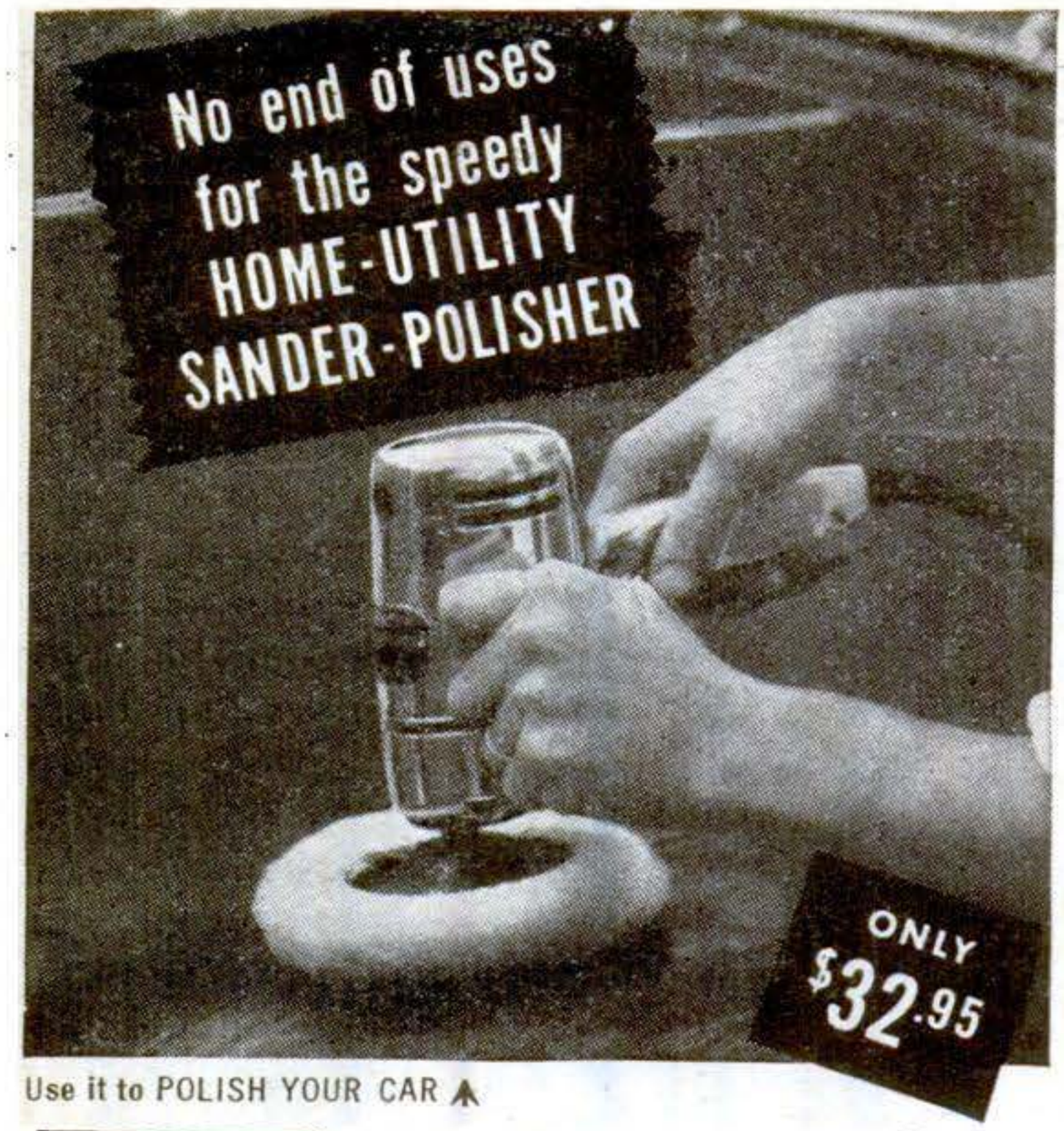
Member Asphalt Tile Institute

Joliet, Ill • Long Beach, Calif. • Newburgh, N. Y.

For faster cleaning . . . more beautiful asphalt tile floors, always use MA-TI-CO Wax and MA-TI-CO Cleaner.

IC45

Copyrighted material

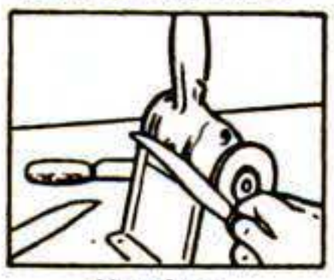


Use it to POLISH YOUR CAR ▲

Use it to SAND DOWN FURNITURE!

Use it to DRILL LEAD HOLES!

Use it for WOOD BORING!



Use it to SHARPEN CUTLERY!

Use it to REMOVE RUST!

This husky, versatile tool drives many attachments to save you time, money and muscle!

You haven't handled a really versatile tool until you've tried the Home-Utility Sander-Polisher! It comes *complete* with sanding discs, lambswool bonnet, ¼″ drill chuck, cans of auto polish and wax. It drives many other attachments for grinding, sharpening, buffing, burnishing and cleaning. And it weighs only 3½ lbs., so it's easy for the whole family to use!

QUALITY-BUILT BY WORLD-FAMOUS BLACK & DECKER, this Sander-Polisher is a real tool, not a mere toy! It has an extra-powerful motor for high-speed work from AC or DC outlets. Its housing is strong, light die-cast aluminum. It has an instant-release trigger switch. Its balanced design means comfortable handling. Try it today at your hardware, electrical or implement dealer's or department store.

The BLACK & DECKER Mfg. Co., Dept. H10S, Towson 4, Maryland

BLACK & DECKER

ELECTRIC HOME-UTILITY TOOLS

DRILLS • LECTRO-SAWS • BENCH GRINDERS

Gus and the Missing Straddle Truck

[Continued from page 256]

out some of the cylinders when the wires touched the metal."

"Ha, wait'll you hear Ned howl when he hears this," said Frank as he wheeled the straddle truck around and headed for the repair shop. "This'll burn him."

"Why?" asked Gus.

"Ever since he heard you were coming out, he's had a 10-buck bet with me that you wouldn't find my miss anymore than he could. Now, he'll have to pay off and he ain't gonna like it."

Ned, however, paid off without a beef.

"Like found money," said Frank taking the two fives Ned handed him. "Here, Mr. Wilson, let me split it with you," he added, thrusting one of the bills into Gus's hand. "After all, you found the trouble."

Driver Apologizes

Gus, slightly flustered, stood holding the bill for a moment, then handed it back. "No, Frank, that was your bet, not mine."

A few minutes later as Gus started up the steps to the mill office to find Don Thatch, he bumped smack into the pickup driver coming down. He greeted Gus with a pleasant smile as the two passed.

After Gus had told Don about fixing the straddle truck he said, "What's happened to your pickup driver? Met him as I was coming in and he was almost human."

"Oh, I called him in to bawl him out about his attitude," explained Thatch, "but before I could say much he apologized for being rude to you. Said he'd had a spat with his wife this morning but he'd try to leave his troubles at home after this."

"Well, I'm ready to get back to the Model Garage any time now," said Gus. "Mind if I use your phone?"

Gus's Hunch Pays Off

"Go right ahead," said Thatch. "Use that one over there; it's an outside line. I'll get my car and meet you out front."

Gus grinned as he read the bold, black headlines that streamered across the local paper the next morning:

STATE POLICE NAB
ALLEGED BANK ROBBER

And the story went on to say:

. . . After searching the premises and finding more than $30,000 in bills stolen from

[Continued on page 260]

Copyrighted material

MARFAK MADE HIS CAR RIDE SO CUSHIONY HE'S SPOILED

Forget about "rough riding." Get longer lasting *Marfak* chassis lubrication, and enjoy "cushiony" driving for 1,000 miles or more! Tough, stretchy *Marfak* is made to resist wash-out, jar-out, squeeze-out. It protects against wear and friction far longer. Get *Marfak* lubrication today. See your Texaco Dealer, *the best friend your car ever had.*

MARFAK Lubrication

TEXACO

THE TEXAS COMPANY

TEXACO DEALERS IN ALL 48 STATES

Texaco Products are also distributed in Canada and in Latin America

TUNE IN . . TEXACO STAR THEATER starring MILTON BERLE on TV every Tuesday night. See newspaper for time and station.

Copyrighted material

For special jobs . . . .
for hobbyists . . . .

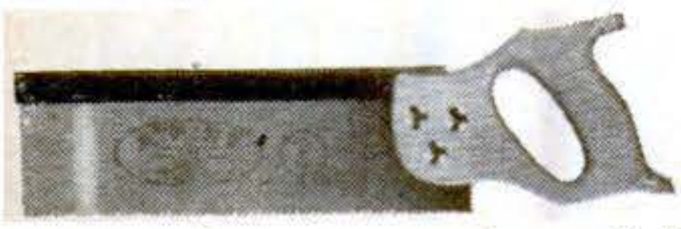
ATKINS JR. SAWS!

Jr.-65

High speed, "*Silver Steel*"—straight back. 16" blade Perfection-pattern, apple wood handle. Identical in everything but size with one of the world's most famous saws. Also available as 18" 6-point rip saw.

Jr.-5

Keyhole Saw Special rounded end for safety. Fully lacquered plain beech handle. Perfectly tempered, flat-ground blade. Atkins "*Silver Steel*" quality through and through!



Jr.-2 Back Saw

Expertly tempered special steel for long-wearing, stay-sharp qualities. Fully lacquered beech handle. Filed and set, ready for duty for dozens of jobs in shop and home.

AND 3 MORE JR. HAND SAWS

Jr.-6, Jr.-4 and Jr.-2. Each a perfect replica of its larger counterpart. Perfect for craftsmen and women with smaller hands. Both the Jr.-4 and Jr.-2 models are available as 18" 6-point rip saws, as well as 16" 11-point crosscuts.

Only ATKINS makes "Silver Steel" products

ATKINS

E. C. ATKINS AND COMPANY
Home Office and Factory:
402 S. Illinois St., Indianapolis 9, Indiana
Branch Factory: Portland, Oregon
Knife Factory: Lancaster, N. Y.
Sales Offices
Atlanta • Chicago • Portland • New York

THERE'S AN ATKINS FOR EVERY SAWING PURPOSE

Gus and the Missing Straddle Truck

[Continued from page 258]

the City National Bank four months ago, a State Police raiding party headed by Sergeant Jerry Corcoran from the local barracks cornered Art King, alias Ned Hoffman, in his quarters at the Empire Lumber Mill last night. King, police believe, never spent the hot money himself, but passed it off on others by changing the bills at the mill office and by asking fellow workers to do his shopping. . .

The slam of the garage-office door interrupted Gus's reading. He turned to find Jerry Corcoran and Captain Torrence, commander of the barracks.

"Okay, private eye," joked Jerry, "how'd you do it?"

They All Slip Sometime

"Well, even though I'm not married," said Gus, "I guess I've been around enough to spot a bleached blond when I see one. Poor old Ned had been neglecting to touch up the part in his hair. Then I discovered that he sure was no mechanic, but loved to play around with a torch. The tip-off came when he settled a bet with one of the other mill hands. Just by luck, I got a look at one of the bills and the serial number matched the list. That plus the fact that he hadn't worked at the mill long and lived by himself over his shop seemed to add up to a fair hunch. That's when I called you, Jerry."

"Gus," said Captain Torrence, "during the 25 years you've been running this garage you've been a tremendous help to us many times and we'd like you to know how much we appreciate it." Torrence straightened, and a note of formality came into his voice. "We of the State Police hope you'll accept this slight token."

Gus opened the small brown leather wallet the captain handed him. Pinned inside was a gold badge with the shield of our state and inscribed: "Honorary Captain—State Police." END

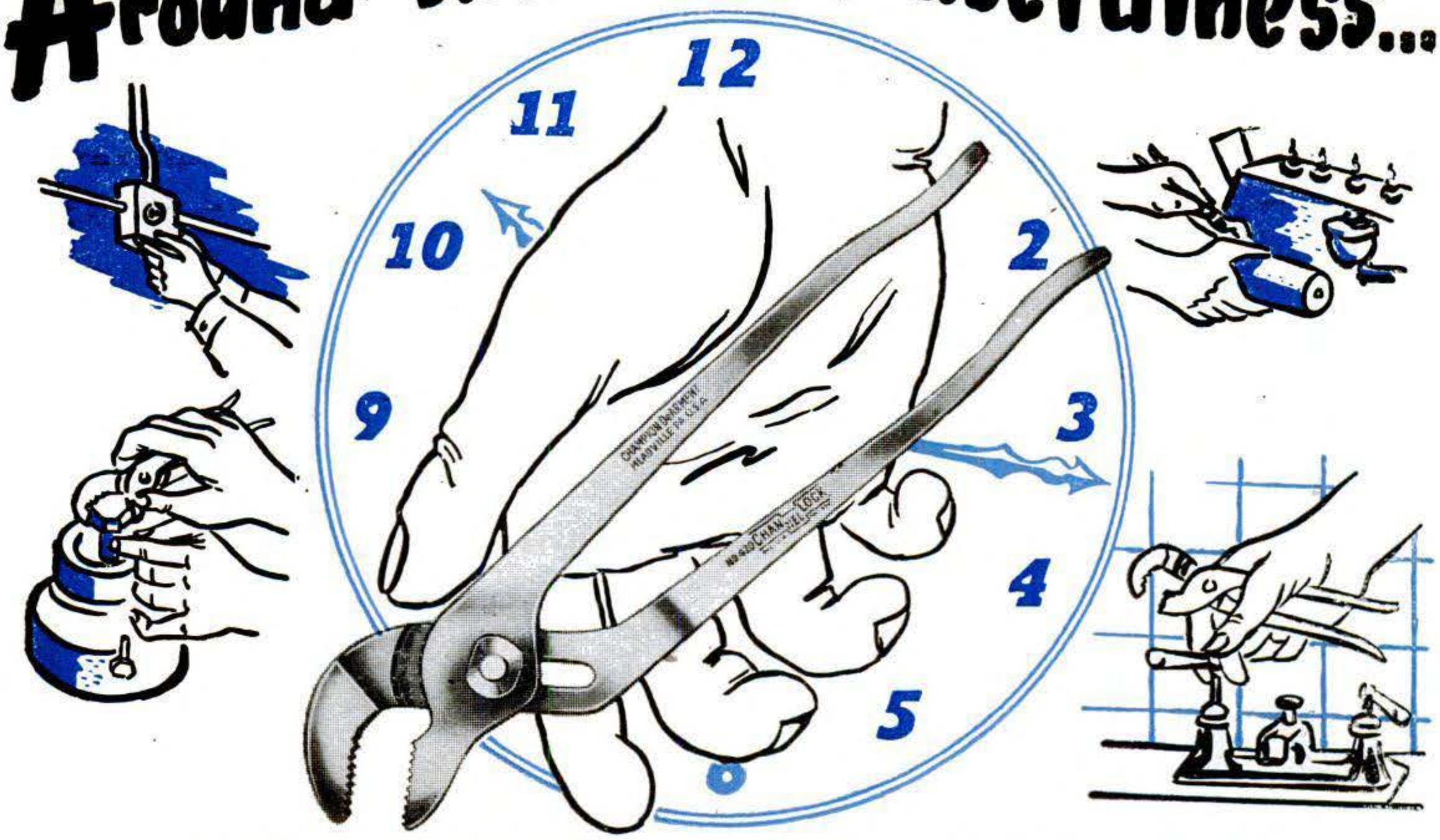
Next month: Gus Gives the Air Force a Lift

What Brought About the Ice Ages?

AMONG the theories propounded by geologists for the existence of the ice ages are: changes inside the sun that reduced the amount of heat radiated; upheaval of land masses, causing abnormally large snowfalls; passage of the solar system through gigantic cosmic dust clouds that reduced the heat received from the sun; and a shift in the earth's rotational axis.

Copyrighted material

Around the clock usefulness...



CHANNELLOCK PLIERS

Made only by CHAMPION DEARMENT!

No matter what the job—plumbing, electrical, automotive or whatever, Channellock pliers are handy to have around. The patented Channellock principle permits a wide range of size adjustments without decreasing gripping power or leverage.

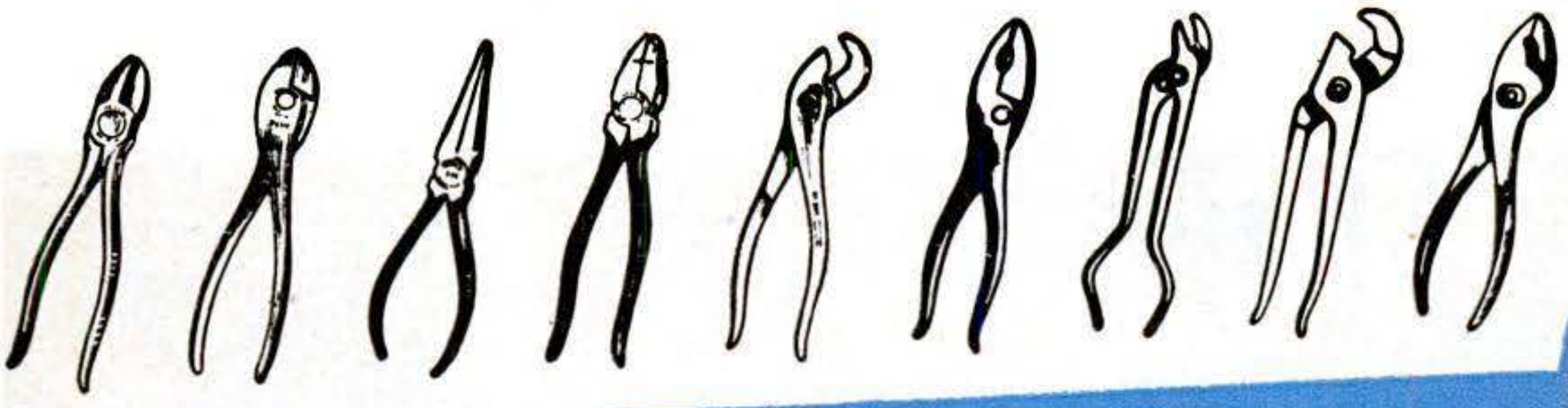
Channellock pliers are made by Champion DeArment—for nearly 3/4 of a century manufacturers of highest quality tools.

Dad, Mom, or the kids will find plenty of uses for Channellock pliers.

And remember—Only Champion DeArment makes Channellock.

Send for Catalog today.

CHAMPION DEARMENT TOOL CO. • Meadville, Pa.



Channellock pliers are listed in the Yellow Pages of most Telephone Directories under "Tools"

Only CHAMPION DEARMENT...

makes CHAN NEL LOCK

TRADE MARK REG. U. S. PATENT OFFICE

Copyrighted material

Fill cracks in chairs—

Makes loose joints firm, sands to a smooth finish!

Reset loose hinges—

Replaces rotted wood, tightens loose screws . . . *easy* to apply!

Repairs broken toys—

Mend cracks, nicks! Smooth finish!

Also useful in filling cracks in floors, nail and screw holes, repairing loose tiles. *Handles like putty . . . hardens into wood!*

PLASTIC WOOD®

A CELLULOSE FIBRE FILLER

IN CANS OR TUBES

DOZENS OF OTHER USES

How to Photograph Your Boss

[*Continued from page 216*]

angle, light, meter, shutter, exposure and the like, you'd better employ what I call the decoy system. Simply unload the task of relaxing your subject onto someone else. You recruit a good talker, someone the boss likes to listen to, from around the office or plant. Important: don't let the decoy start kidding about the picture taking. That only prolongs the self-conscious period. Instead, brief the decoy in advance, have him primed with serious and interesting topics to take up with the boss. Warn him not to pitch questions; he must do the bigger part of the talking. You want to shoot while the boss is listening, not when his mouth is open answering questions. I once photographed a president of Standard Oil, and made the mistake of asking about his trip to Alaska. His type of camera shyness took the form of answering my question for an hour.

Include Hands and Body

Before the decoy goes into action, I suggest you drag the boss's chair out from behind the desk. You're there to photograph the man, not the walnut. Face the chair toward the decoy slightly sideways to the camera (a head-on or broadside is harder to make interesting). Make sure there's no lamp, shiny wood paneling or patterned material behind to distract. Since almost the toughest assignment is to make a standard head-and-shoulders shot interesting, stay back far enough to include hands and body positions. That way you can hope for more variety when the boss gets to talking.

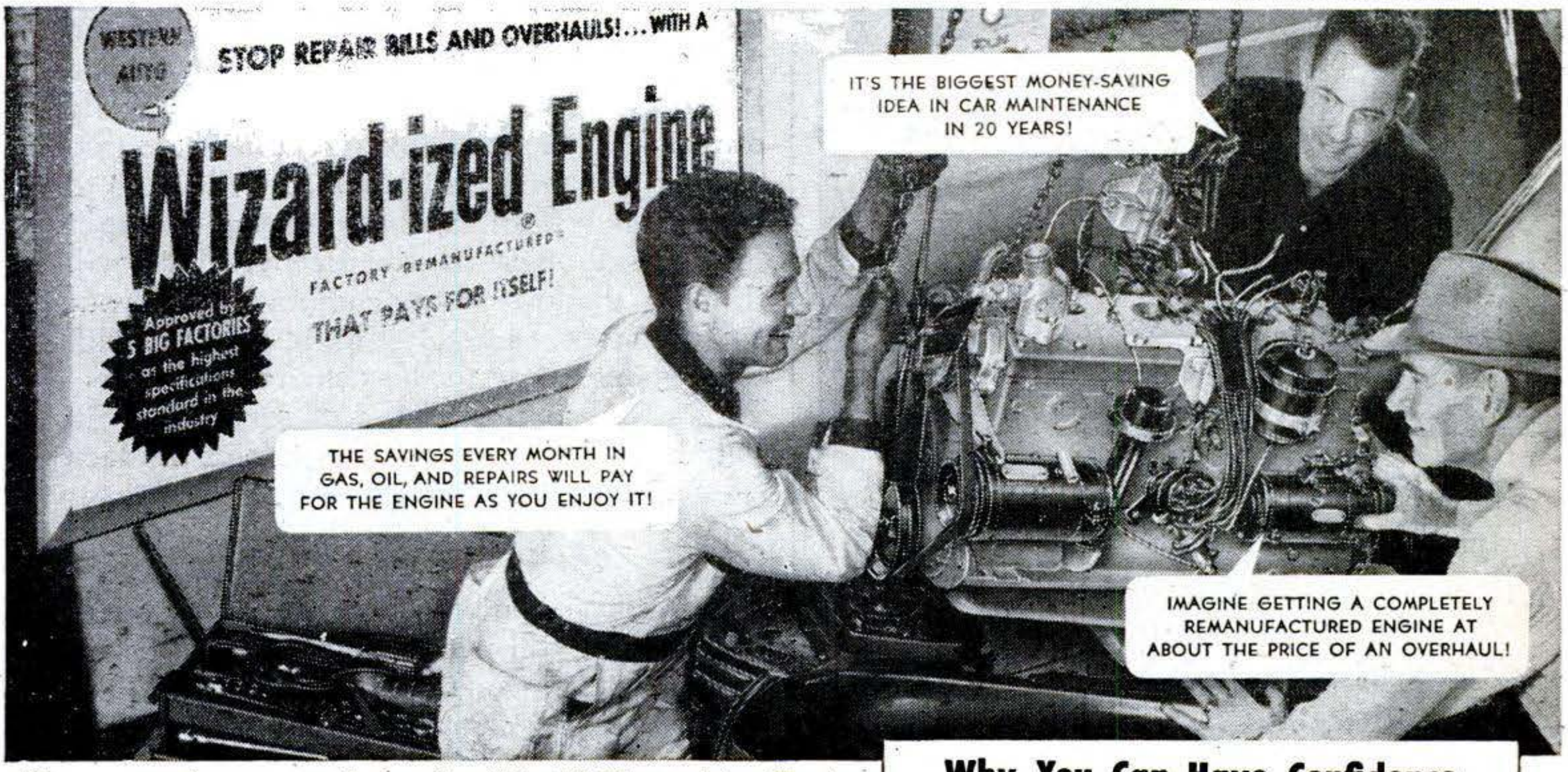
Don't try to pose your subject; make him pose himself. If he's accustomed to smoking, let him. If he wants to put his hands in his pockets, let him. He'll feel more comfortable—and you'll get a better picture. But don't try to make a smoker out of a nonsmoker just for the sake of an interesting picture, or hide a pair of particularly expressive hands just to get them out of the way. Let him do in front of the camera exactly what he would do behind its back, and you'll be sure of a pose that's neither stylized nor unnatural.

Lighting should be simple. Complications in lighting are all right if you know what you're doing and can clamp your subject in a vise. But tricky lighting—shooting in from the side and top—can ruin you if your subject's head moves away from its

[*Continued on page 264*]

"New-Engine" Your Car Now For As Little As $16 Down

(TERMS VARY BY AREA AND MAKE OF CAR)



***Your easy, low-cost solution** for "tired" Chevrolets, Fords, Plymouths, Pontiacs, Dodges, and other popular makes. Wizard-ized Engines are fully remanufactured in 5 large factories (not just shops or garages). Engine accessories are used from old engine, or may be replaced new.

Get Another 50,000 Miles or More from Your Car With a WIZARD-IZED ENGINE That Pays for Itself!

Thousands have discovered this easy new way to end costly repair bills—simply by replacing their old engines with low-cost Western Auto Wizard-ized Engines . . .

No other engine—no overhaul job—can give you more power-packed miles at so little cost! And, you get . . .

The same engine guarantee that comes with a new car—plus a free 500-mile service inspection of our installation. Every Wizard-ized Engine gets a . . .

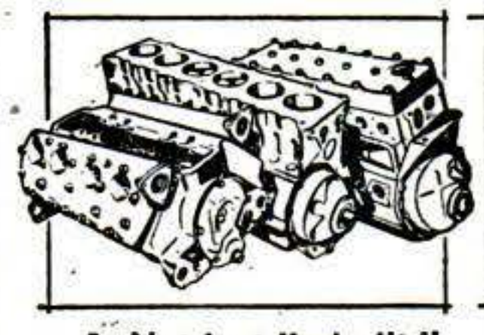
Complete factory inspection and then a final test run. Our installations made by trained mechanics in fully equipped garages. And, this new car power is yours for . . .

Half the cost of a new engine. You're paying for it in gas, oil, repairs . . . why not enjoy it now? For . . .

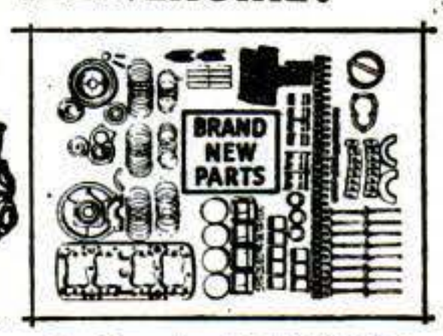
Less than ⅓¢ per mile, you get years of new miles without paying the high cost of a new car. Don't wait . . .

See your Western Auto man tomorrow . . . find out about his guaranteed trade-in allowance for your old engine! ➔

Why You Can Have Confidence In a WIZARD-IZED ENGINE!

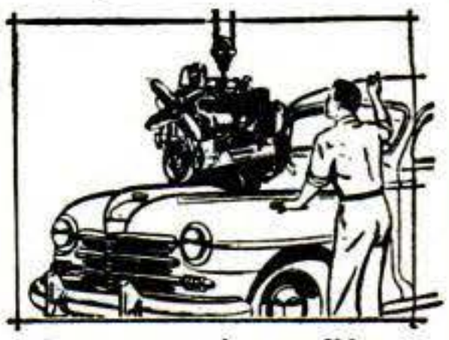


1. Not just "rebuilt," but completely remanufactured—using selected original factory block.



2. Typical BRAND NEW top quality parts in Wizard-ized Engines. All other parts fully remanufactured.

3. New car engine guarantee . . . by America's largest group of auto supply stores (over 3000).



4. backed by a fifty million dollar firm with 25 million customers, proof of dependability!

EASY TERMS AS LOW AS $3.00 weekly
Terms vary by area and make of car

Wizard-ized® Engines

FACTORY REMANUFACTURED*

The Engine You Can Buy with New Car Confidence!

Sold Only By WESTERN AUTO STORES & ASSOCIATE STORES

NOTE: Western Auto Associate dealers own their own stores and set their own prices. Terms and conditions quoted are recommended, and subject to variance. © 1951, Western Auto Supply Co., K. C., Mo. (Sa101)

Copyrighted material

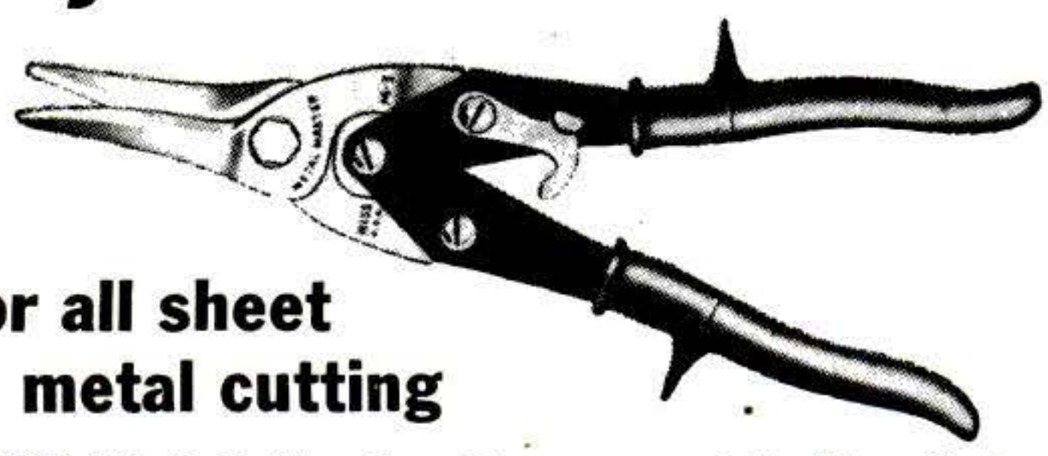
Refinish

without drudgery or danger

IT'S FAST! IT'S CLEAN! Sold at leading paint, hardware and department stores.

Product of
W. M. BARR & CO.
2358 S. Lauderdale • Memphis 2, Tenn.

Buy the Best...WISS!



for all sheet metal cutting

WISS Metal Master Compound Action Snips

#M-3. Easily cuts 18 gauge sheet metal. Cuts curves and circles as well as straight. Ideal for the home workshop. $4.25. Rubber grips recommended, 60¢ extra.

WISS Straight Cut Snips

#9. Crucible steel inlaid blades. The basic snips for straight metal cutting. Gun metal handles. Overall length 12½". $5.25.

WISS Combination Snips

#V-13. Solid steel, with gray japanned handles. Cuts curves and irregular shapes with ease. Handy pocket size. 7" long. Accurately tempered jaws and strong bolts. $1.85.

J. WISS & SONS CO. • NEWARK 7, N. J.

How to Photograph Your Boss

[Continued from page 262]

original position. Anyway, who wants to make portraits that arouse a "What marvelous lighting!" Better the comment: "That's the man, exactly."

With a small camera and a fast lens, you might use the natural light from a window if it looks well on your subject. If the shadows are too dark you can take a tip from the candid cameramen, who often "cheat" a little by adding a little fill light to the shadows with a photoflood bulb heavily diffused. If the available daylight is too dim or from the wrong direction, it will have to be mazda or flash. I advise placing one light to the side next to the decoy. This will throw a shadow on the camera side of your subject's face. A smaller bulb, diffused with tissue paper next to the camera and close—very close—to the lens, will serve as a fill light, preventing the shadow side of the face from coming out too dark.

Flash Has Advantages

With flash you won't burn up your boss's eyes as you will with mazda, and flash will mean that he won't have to hold still, and you can catch fleeting action and expressions. But with a flash rig fixed to your camera you're sunk—despite the fact that many cameras come this way and most flash outfits are made to clamp onto the camera. Lighting from close to the lens will make your boss's face about as interesting as a newly ironed bedsheet. Get the light off the camera for roundness and texture.

Once you've got the setup right, you can stop acting like a technician. Now you become a picture reporter, a creator, the man with the finger sensitized to react in a split second whenever that beguiling, contemplative, challenging, amused, wonderful expression flits across the boss's face. Click, and you, the recorder, have set down a facet of a man. And that is not such a small thing to have accomplished. END

Radio Waves and X Rays Are Close Kin

RADIO waves and X rays are different forms of electromagnetic radiation. The difference lies only in the length of their waves and frequency of vibration. Of highest frequency and shortest wave length are the cosmic rays that bombard the earth from outer space. These may vibrate as fast as 1,000,000,000,000,000,000,000,000 times a second.

Copyrighted material

DU PONT URGES TWO STEPS NOW

. . . BEFORE COLD WEATHER CAN CRIPPLE YOUR CAR

1st get your cooling system checked and serviced

When the cooling system quits, your car quits. If your cooling system is clogged with rust and scale, your engine will overheat. If your cooling system isn't tight, you'll lose anti-freeze mixture and risk a freeze-up. So before you put in any anti-freeze, no matter whose, have your cooling system thoroughly gone over. It is well worth the little it costs.

Go to an expert. **The dealer who displays this emblem offers you a *special* winter service. Make a date with him early for anti-freeze and for a thorough cooling system check-up before the anti-freeze rush jams his driveway.**

2nd get a Du Pont Anti-freeze

"ZERONE"

(TYPE S)

There's no evaporation problem with Du Pont "Zerone"*—it's trouble-free, needs only an occasional check-up. Use it if you drive at normal altitudes, if your car has a standard thermostat (4 out of 5 cars do), and if you protect to temperatures no colder than thirty degrees below zero.

$1.50 A GALLON

O. P. S. RETAIL CEILING PRICE

"ZEREX"

(TYPE P)

"Zerex"* is made by Du Pont to meet these special driving conditions: *High-opening thermostats*—adjusted to run at 160 degrees F., or higher, *high-altitude driving*, and *extreme low temperatures*. If your driving requires a "permanent"-type anti-freeze, you can't do better than "Zerex."

$3.75 A GALLON

O. P. S. RETAIL CEILING PRICE

*REG. U. S. PAT. OFF.

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

Copyrighted material

Plane Trails Are Ice

THE long white smoky trails sometimes seen behind airplanes flying at high altitudes are made of ice crystals. They are formed when moisture-saturated air compressed by the leading edge of the wing moves to the back of the wing and expands, causing a rapid cooling that freezes the water vapor to ice. The effect is especially pronounced behind high-speed jets.

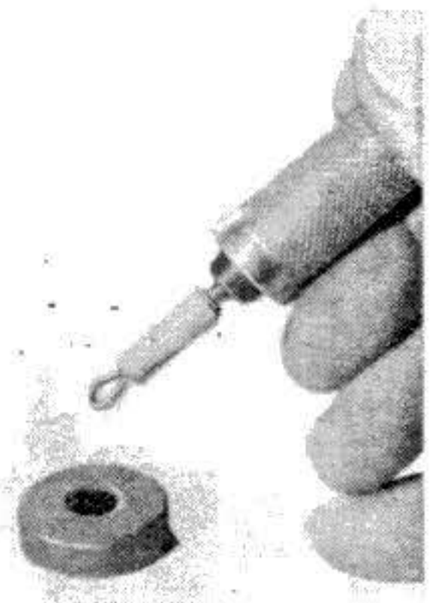
Removing Rust Stains from Enamel

LIGHT rust stains may be removed from an enameled sink or refrigerator by applying lemon juice or vinegar to the spot. Let it stand a few minutes and then wash away with water. Heavier stains may need a diluted solution of hydrochloric acid. As this is corrosive, apply with cotton at the end of a stick, and avoid touching unenameled metallic parts.

Musical Note Controls Gyro

A SINGLE musical note, traveling almost 1,000 miles, is being used to regulate the speed of sensitive gyroscopes. The note, A above middle C, with a vibration of exactly 400 cycles per second, is broadcast by the National Bureau of Standards' short-wave station WWV near Washington, D.C. It is then picked up by Minneapolis-Honeywell engineers in Minneapolis, where it checks a tiny electronic fork attached to a gyroscope.

Sanding with a Cotter Pin



NEED a small drum sander for smoothing holes fast? A medium-sized cotter pin and a little strip of abrasive paper will make one. Slip one end of the paper between the legs of the pin and wrap it around clockwise, as seen from the eye end of the pin. Cement the outer end down. Chuck the shank of the pin in a hand grinder.

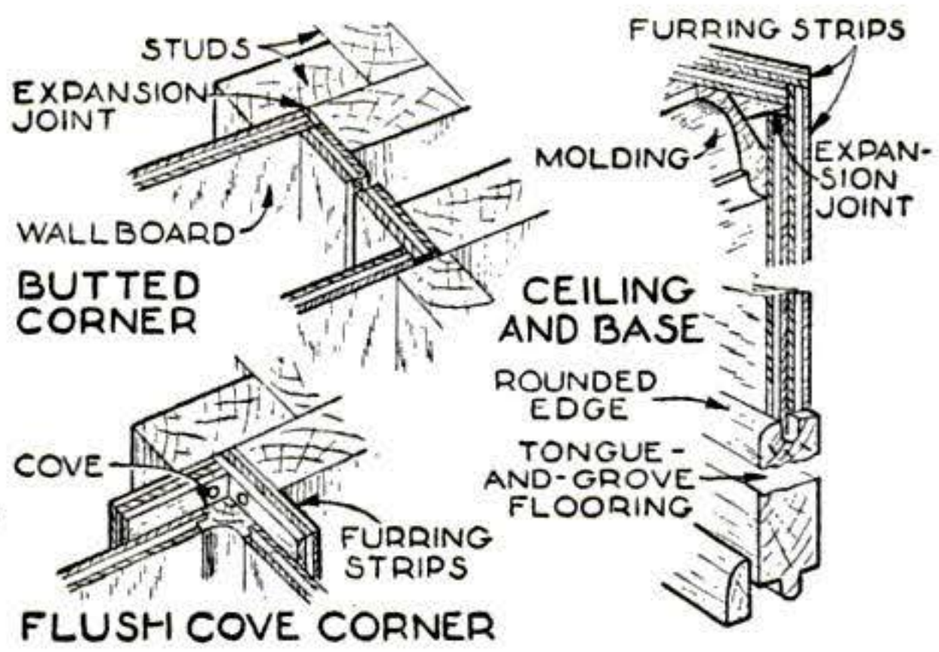
When Is Next Eclipse of Sun?

THE next total eclipse of the sun visible in the United States will occur on June 30, 1954. It will be seen along a 100-mile-wide strip, starting in Nebraska and moving in a northeasterly direction over South Dakota, Minnesota, Wisconsin and Canada.

Sunshine Discolors Antique Glass

CLEAR antique glass will frequently turn purplish after long exposure to the sun. This is a result of chemical action caused by the ultraviolet rays in the sun's light that changes the manganese oxide in the glass to the permanganate form, which is purple in color. Modern glass, using other chemicals, is not so affected.

PLYWOOD CORNERS



When plywood used for interior walls is nailed directly to studs, allowance should be made for movement at the corners. Most simple is the butting of one edge against the face of the adjacent sheet. Expansion space is left at the edge of the sheet butted against. Unless corner studs are unusually straight, the butting edge will have to be scribed to make a close joint.

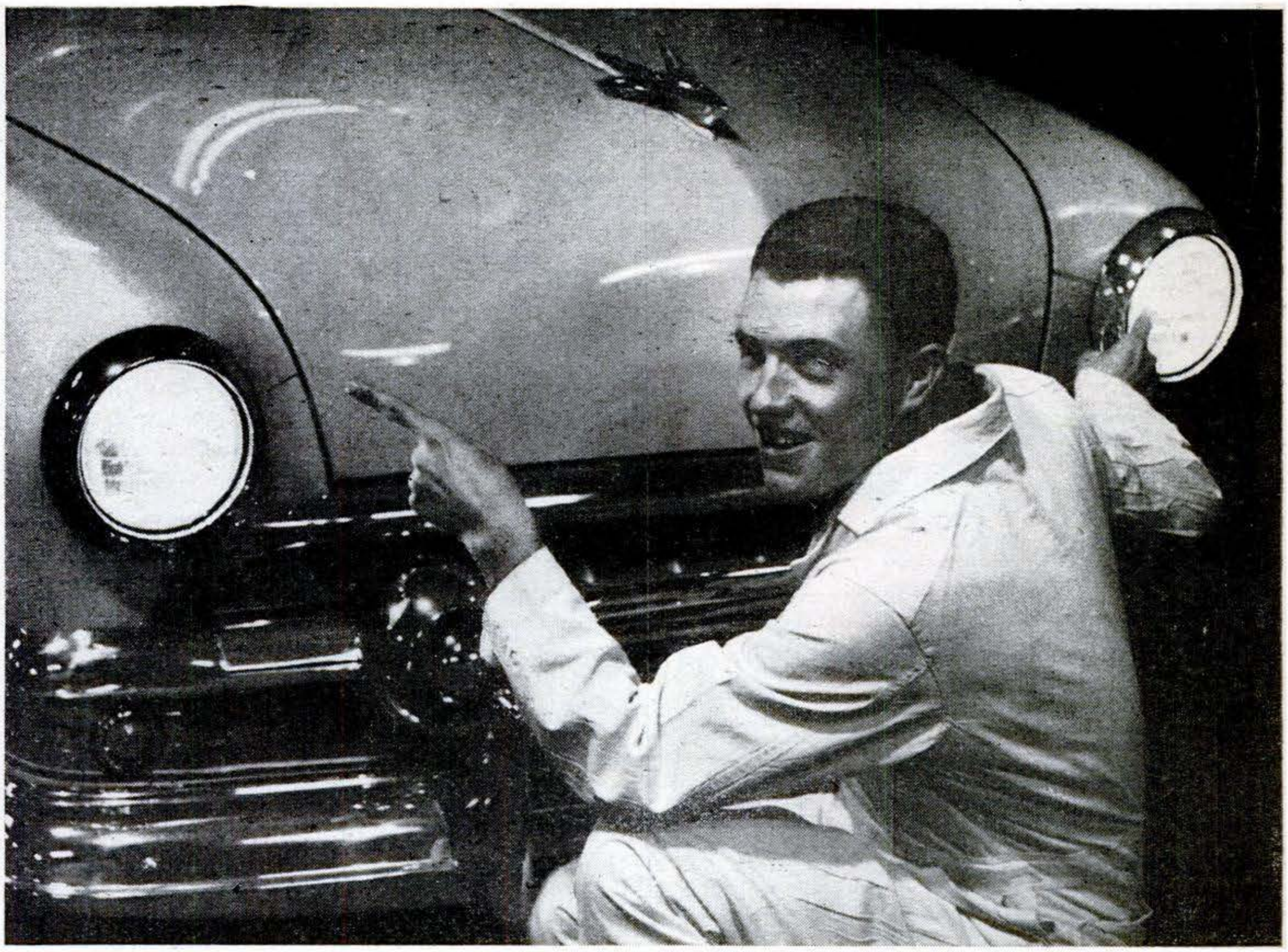
In better installations where furring strips are nailed to the studs and the plywood is glued, corners can be made solid with glued rabbets, cove strips, and the like. If the cove strips have rabbeted edges to match rabbeted edges of the plywood sheets, they can be nailed in to hold the plywood edges while the glue is drying; thus rabbeted cove and plywood surfaces are made flush more easily than plain-edged coves butted against square-edged plywood.

The same kind of corner can be used at the ceiling, or the joint may be an open butt covered with a cove molding or a more elaborate cornice.

If the plywood is carried to the floor, it will be subject to scuffing unless protected by a baseboard. A matched flooring board nailed with the groove up to receive the plywood is easily installed.

FOR YOUR POPULAR SCIENCE INFORMATION FILE

Copyrighted material



Which lamp is ready to burn out?

ONE of the General Electric "All-Glass" headlamps on the test car above has just been lighted for the first time. It's at the beginning of its life. The other G-E lamp... the one on the left . . . has been burning day and night for many, many months. Yet when the photo was taken it was impossible to see any difference in the light output of these 2 lamps!

That's because General Electric "All-Glass" headlamps give an average of 99% as much light just before burning out as when new. Both the lens and reflector of the G-E headlamp are made of hard glass, fused together into one piece. Road and laboratory tests prove that this one-piece unit keeps out the dirt and moisture that might otherwise gradually rob the lamp of light output.

Because they DO NOT GROW DIM, G-E "All-Glass" headlamps mean easier, SAFER night driving. Use them to replace burnouts whenever you need a replacement.

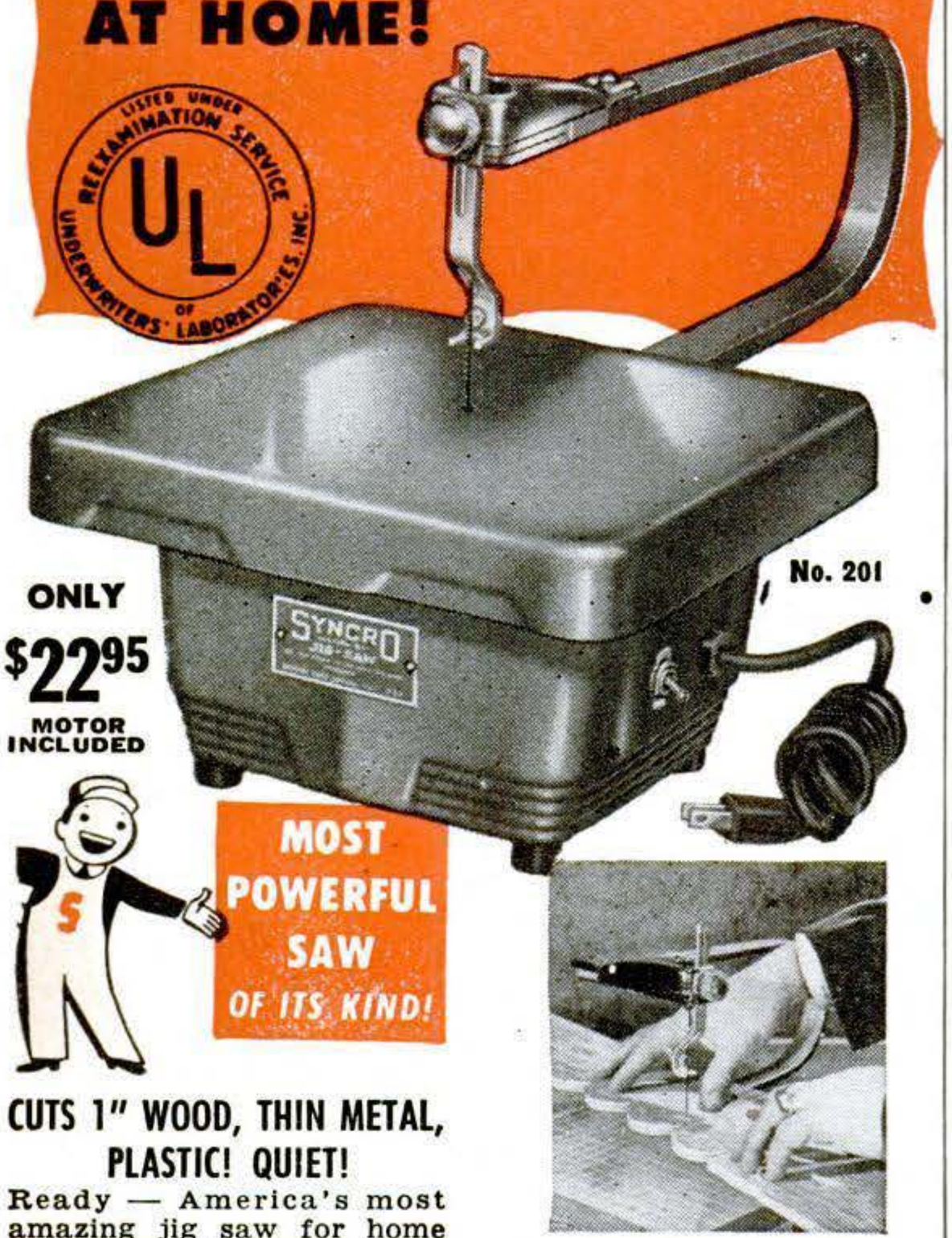
G-E "All-Glass" Headlamps DO NOT GROW DIM!

You can put your confidence in—

GENERAL ELECTRIC

Copyrighted material

BIG MONEY
USING AMAZING NEW, SAFE JIG SAW
AT HOME!



ONLY $22.95 MOTOR INCLUDED

MOST POWERFUL SAW OF ITS KIND!

CUTS 1" WOOD, THIN METAL, PLASTIC! QUIET!

Ready — America's most amazing jig saw for home fun or profit! Largest, most powerful saw of its kind! QUIET, ideal for apartments! SAFE . . . blade does NOT pull fingers toward it. No belts, gears or oiling! Adjustable "any length cut" arm. With BUILT-IN New Reactance Type Electric Motor, $22.95 at dealers or postpaid.

Arm adjustable for cutting any length material!

SYNCRO POWER UNITS GUARANTEED AGAINST BURN-OUT DURING YOUR OWNERSHIP OR REPLACED FREE!

The Name You Can Trust

SYNCRO QUALITY TOOLS

ELECTRIC JIG SAW

U.S.A. Model No. 201. 60 Cycle, 110-120 Volt AC. Other Voltages, Cycles available. Dealers, Jobbers — Write!

USE COUPON FOR CIRCULAR OR DIRECT ORDER

SYNCRO CORP., DEPT. G-101, OXFORD, MICHIGAN, U.S.A.

☐ **ORDER.** I enclose $22.95. Send No. 201 Saw postpaid on 10 Day Money Back Guarantee.

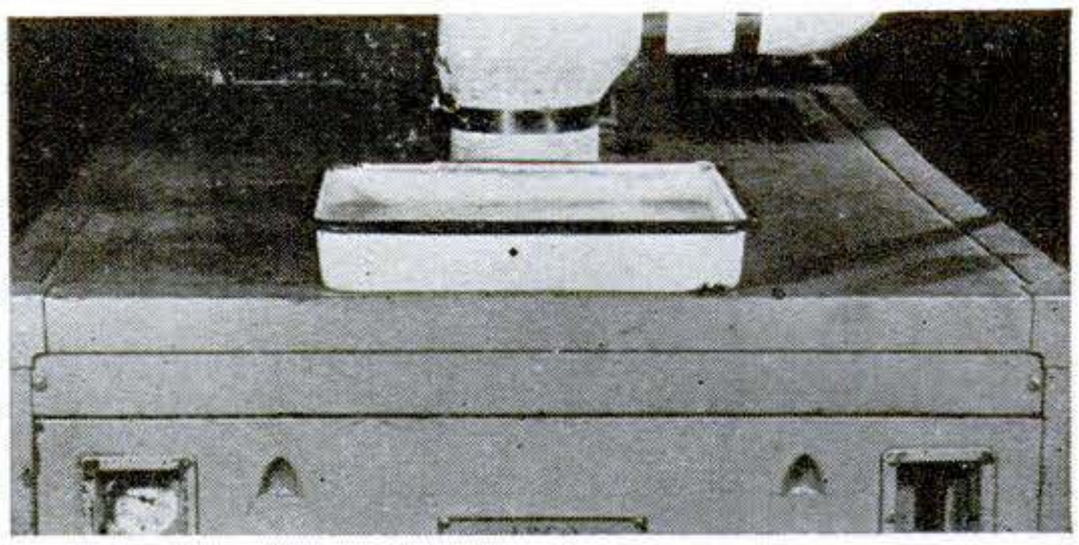
☐ **FREE CIRCULAR.** Send new SYNCRO CIRCULAR showing new SAW and NEW SANDER.

WRITE NAME, ADDRESS BELOW — MAIL TODAY!

Cart Made from Baby Carriage

I DON'T strain my back moving ash barrels and other heavy objects any more, thanks to this utility cart. To make it, I simply removed the body and springs from a discarded baby carriage, and then sawed off half the frame that joined the front and rear axles. I find the cart particularly handy for easing barrels up and down stairs.—*J. J. Stefanowski, Bayonne, N. J.*

Photo Tray Is Humidifier Pan



ENAMELED photographic trays that are too chipped to be used in the darkroom any longer make fine humidifiers for the furnace. —*R. Hertzberg, Jackson Heights, N. Y.*

Hinges from Adhesive Bandages

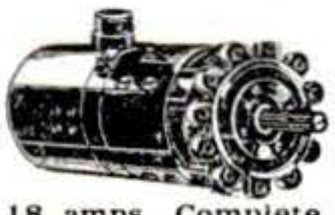
I SAVE the stiffened gauze or crinoline from adhesive bandages and use it for repairing book bindings or for hinges on projects made from cardboard or other light material. After a hinge is applied with glue, it can be covered with a strip of paper.—*Frank Shore, New York City.*

Copyrighted material

GROBAN'S WAR SURPLUS SPECIALS

ALL BRAND NEW — FULLY GUARANTEED

D.C. GENERATORS



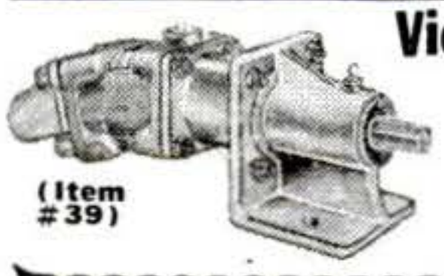
For welders, plating, truck and marine use, D. C. appliances, lights, etc. Aircraft quality —lifetime grease sealed ball bearings. Heavy duty.

Item #131—Brand new Electric Auto-Lite 12 volt Direct Current electric generators, rated 18 amps. Complete with blower and pulley. Use for trucks, tractors, boats, battery chargers, etc. Part No. GEF-4805A. In original sealed U. S. Army cartons. $40.00 value. Shpg. wt. 27 lbs. F.O.B. Chicago. Now Only..... **15.00**

Item #90—Type P-1, rated 200 Amps.—28 Volts, 2500 RPM. Mfd. by General Electric, Ford, Delco-Remy and Westinghouse. Gov't. Acq. Cost $300.00. Shpg. wt. 53 lbs. F.O.B. Chicago..... **22.50**

Item #91—Type R-1, rated 300 Amps.—30 Volts. Mfd. by Jack & Heintz. Gov't. Acq. Cost $380.00. Shpg. wt. 59 lbs. F.O.B. Chicago. Each individually packed in wooden box **35.00**

Vickers HYDRAULIC PUMP



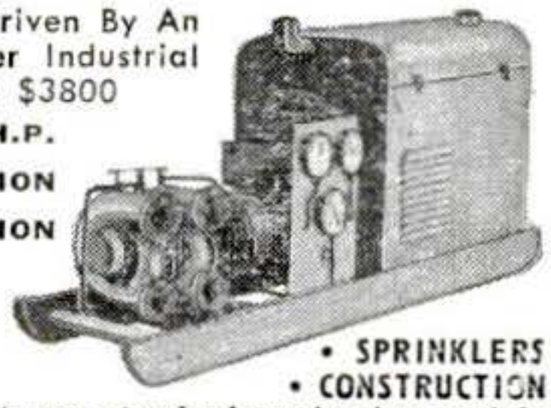
(Item #39)

Piston Type Ideal for use with hydraulic cylinders and valves described in this page ad. Vickers constant displacement piston type pump delivers .507 cubic inches per revolution, 8 gallons per minute at 3750 RPM. 1000 PSI. Has ½" diam. shaft, ¾"-18 thread inlet and outlet ports. Rotation—clockwise. Ppd. **19.90**

Item #132 BYRON-JACKSON "PUP"

CENTRIFUGAL PUMP UNIT

2 Stage Model "PUP" Pump Driven By An 8 Cylinder Model C-36 Chrysler Industrial Engine. Gov't Acquisition Cost $3800

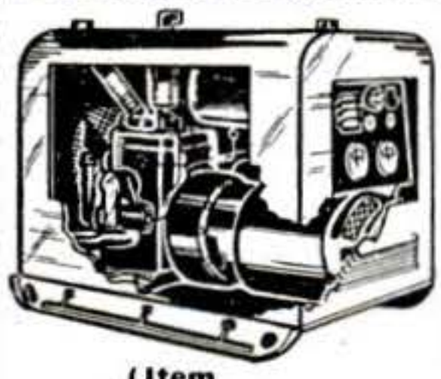


ENGINE SPEED 2400 RPM—100 H.P.
600 GPM AT 175 PSI— PARALLEL CONNECTION
300 GPM AT 375 PSI— SERIES CONNECTION

Ideal For: • PIPE LINE SERVICE • IRRIGATION • PICK-UP • SALT WATER DISPOSAL • GATHERING • FIRE FIGHTING • SPRINKLERS • CONSTRUCTION

These skid-mounted Pumping Units are standard production models with parts and service readily available. Designed for a wide range of operating conditions particularly where wide variation in head and capacity are required. Twin suction and discharge ports are cast on the same side and so arranged that external piping is interchangeable for either parallel or series pumping applications. Overall dimensions, 114" L x 29" W x 62" H. Weight 2480 lbs. Now, complete with operating instructions and performance data. F.O.B. Chicago **1495.00**

A. C. GENERATING PLANTS



(Item #133)

(Item #86)

IMMEDIATE DELIVERY—LARGE STOCK—MANY SIZES

Item #133—3 KW—120 Volts—60 Cycle A.C. Single Phase HEAVY DUTY

DESIGNED FOR CONTINUOUS OR INTERMITTENT SERVICE

PLENTY OF CURRENT TO OPERATE YOUR— • OIL BURNER • REFRIGERATOR • HOME FREEZER • SUMP PUMP • POWER SAW • BROODER • CREAM SEPARATOR • INCUBATOR • VENTILATING FANS • MILKING MACHINES • BLOWERS • YARD LIGHTING • OTHER APPLIANCES

(Item #88)

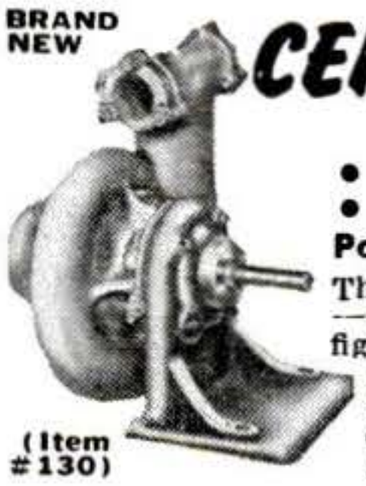
Totally enclosed power unit with 2 cylinder water-cooled Hercules Model BXB engine direct coupled to generator. Magneto ignition, crank start, 4 gallon gas tank, 3 qt. oil capacity. Skid mounted with handrails for carrying. Instrument panel including killer button, oil pressure, water temp. gauges, voltmeter, ammeter. Shipping wt. 560 lbs. F.O.B. Chicago.....Item #133 **395.00**

Write for information on other size generating plants ranging from 350 watts to 25 KW.

GENERAL MOTORS — ALLISON

CENTRIFUGAL PUMP

BRAND NEW



(Item #130)

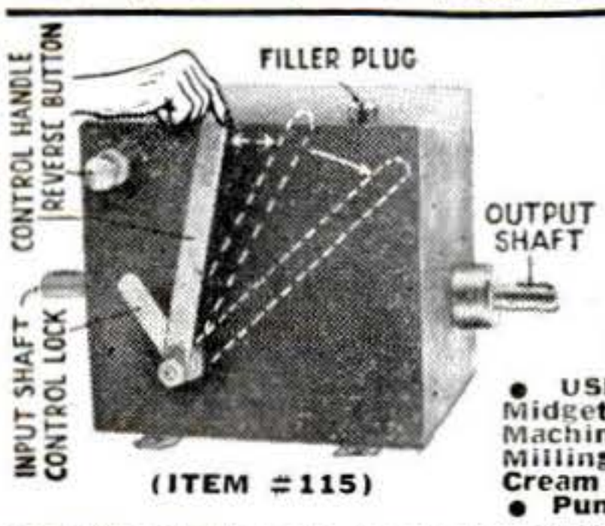
200 GALLONS PER MINUTE

• For Draining Basements • Fire-Fighting • Irrigation • Fuel Transfer • Swimming Pools • Home Water Systems • Dewatering

This General Motors-Allison Centrifugal Pump —designed for use on U. S. Air Force Mustang fighters, now converted for commercial, home, and industrial high volume pumping applications. Inlet, 2½" standard pipe thread, twin outlets with 1¼" pipe thread, ball bearing supported ¾" shaft. Easy, fast simple priming. Rotation, counter-clockwise facing shaft. Shipping wt. 35 lbs. Gov't acq. cost $145.00. **Now Only 39.50** F.O.B. Chgo.

Suction Lift	Head Pressure	Gal. Per Min.	H.P.	R.P.M.
10'	75'	260	6.0	3500
10'	65'	200	5.2	3500
10'	80'	40	1.5	2500
10'	50'	140	5.0	3500
10'	30'	100	3.0	2500

HYDRAULIC SPEED REDUCER



(ITEM #115)

with FINGERTIP CONTROL

• USE FOR: • Reamer Drives • Midget Cars • Feed Mills • Canning Machines • Conveyors • Lathes • Milling Machines • Motor Boats • Cream Separators • Garden Tractors • Pumps

Variable output speeds ranging from 0 to input speed now available. Merely move control handle until desired speed is attained. Then turn locking handle to maintain the setting. Internal relief valves prevent overloading. Use input power of ¼ to 1½ H.P.

This Westinghouse-Oil Gear Unit converted to commercial use from 40 MM anti-aircraft traversing mechanisms consists of a variable displacement hydraulic pump feeding a fixed displacement hydraulic motor. These components are contained in a crackle-finish steel oil reservoir (capacity 2 qts.). Adjustable relief valves set at factory for 100 inch pounds of torque may be reset up to 180 inch pounds. Independent reverse control allows full output power and speed selection in either direction of rotation. Both input and output shafts measure ⅝" diam., include keyway. Input rotation is counter-clockwise facing shaft. Recommended input speeds not to exceed 750 R.P.M. Over-all dimensions 7½"x7½"x11½". Gov't acquisition cost, $428.00. Shipping weight 31 lbs. Complete with 2 qts. of oil and full instructions. F.O.B. Chicago..... **54.50**

Hydraulic Cylinders-Air or Oil

Large supply of new labor-saving, economical hydraulic equipment in many types and sizes. Use these positive, highly efficient smooth pressure hydraulics on presses, arbors, lifts, loaders, power control, positioning, brakes, plastic dies, auto frame alignment, etc., etc.

ITEM #70—Purolator hydraulic oil filter. Permanent element type. ⅜" female pipe thread ports. Capacity 16 gallons per minute. A $13.00 value, now **postpaid**..... **4.95**

ITEM #4—All steel double action hydraulic cylinder. 1⅛" bore, 2⅞" stroke. Clevis mounting. Will lift 1000 lbs. with 1000 P.S.I. line pressure. Perfect for positioning and feeding movements. Shpg. wt. 4 lbs. **Postpaid**..... **4.95**

(Item #42)

ITEM #127—Double acting hydraulic cylinder. 1" bore, 1" stroke, ½" diam. shaft, ¼" tubing thread ports. Over-all length closed—6½". Clevis mounting at both ends. Perfect for clamping and feeding. **Postpaid**..... **5.95**

ITEM #33C—Double action hydraulic cylinder. 1½" bore, 4½" stroke. Clevis mountings at both ends. Uses ¼" pipe fittings. **Postpaid**..... **8.95**

ITEM #16C—Double acting hydraulic cylinder. 1½" bore, 26" stroke. Will lift 1760 lbs. with 1000 PSI line pressure. Weight 8 lbs. A $55.00 value. Now Only. **Postpaid** **16.95**

ITEM #103—Double acting hydraulic cylinder. 2½" bore, 17" stroke. Clevis mounting. Will lift 4900 lbs. with 1000 PSI line pressure. 1¼" diam. shaft. ⅜" tubing thread ports. Overall length closed 28". Shpg. wt. 11 lbs. F.O.B. Chicago..... **21.50**

ITEM #31C—Double action hydraulic cylinder, 3½" bore, 11" stroke. Aluminum alloy cylinder wall and all steel 1⅛" piston rod. Clevis mounting at base and shaft. 19½" over-all length closed. Will lift 9625 lbs. using 1000 PSI from Logan Heavy Duty Hydraulic Pump. Uses ⅜" tubing fittings. Value $102.00. Shipping wt. 11 lbs. F.O.B. Chicago..... **22.50**

ITEM #6—Double action hydraulic cylinder, 3" bore, 24" stroke, will lift 7070 lbs. with 1000 PSI line pressure. Steel barrel, 1⅛" stainless steel shaft. Gov't acq. cost $176.00. Ship. wt. 30 lbs. F.O.B. Chicago..... **28.00**

ITEM #42—Double action hydraulic cylinder, 4" bore, 18" stroke. Rated lift capacity with 1000 PSI line pressure is 12,500 lbs. Ship wt. 30 lbs. F.O.B. Chicago. An Excellent Buy for..... **32.50**

HYDRAULIC CONTROL VALVE

(Item #126)

Newly Manufactured to Our Specifications

Four-way, open center control valve with built-in adjustable relief valve. Factory set at 1000 PSI., spring-loaded neutra position, for use with one double-acting cylinder. Fully balanced plunger type, smooth, positive, easy operation, can be used as single unit or mounted in series of any combinations desired. Has ¾" pipe thread inlet and outlet, ½" pipe thread cylinder ports. Shipping weight 8¼ lbs. An outstanding Buy! F.O.B. Chicago..... **21.50**

FREE: NEW 48-PAGE CATALOG

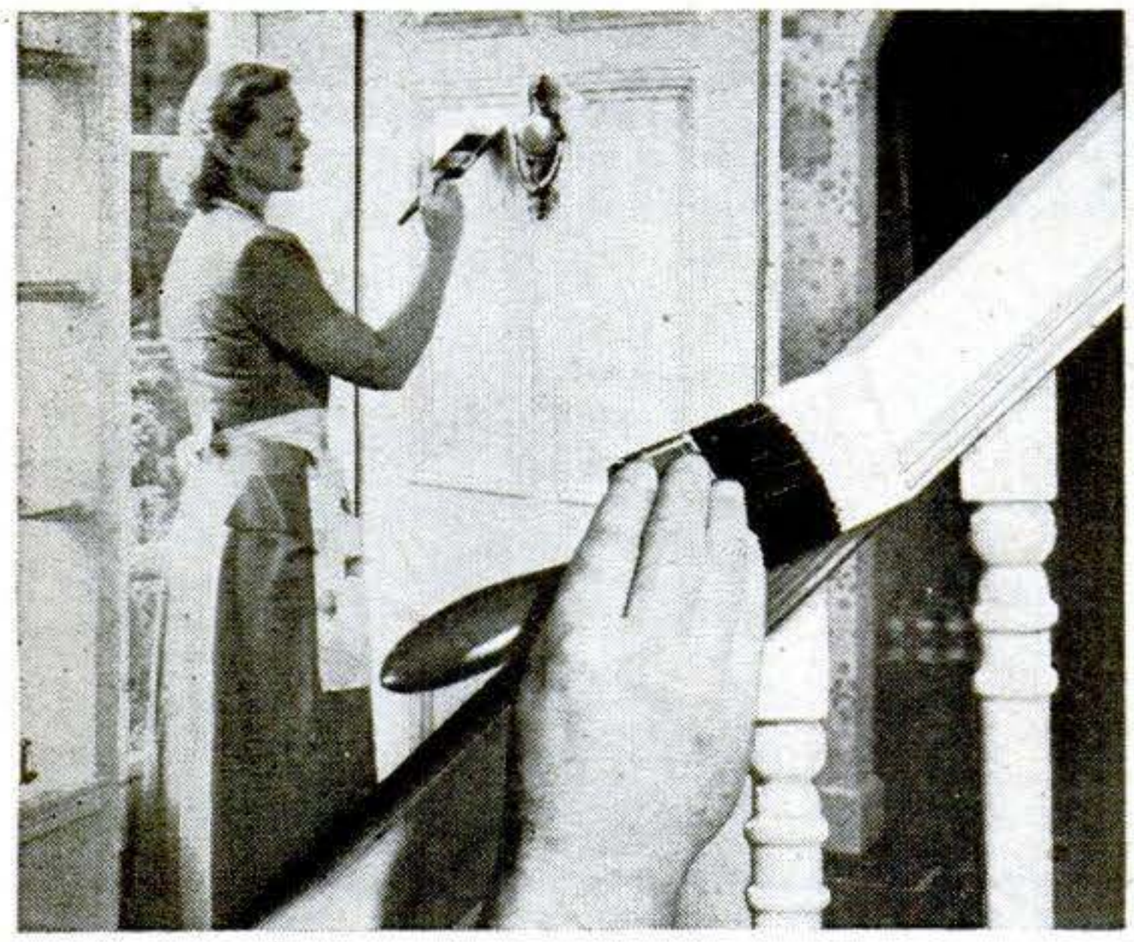
loaded with outstanding War Surplus BARGAINS in farm, home, factory and workshop equipment.

ORDER DIRECT FROM AD — SEND PAYMENT OR PURCHASE ORDER TODAY — SATISFACTION GUARANTEED

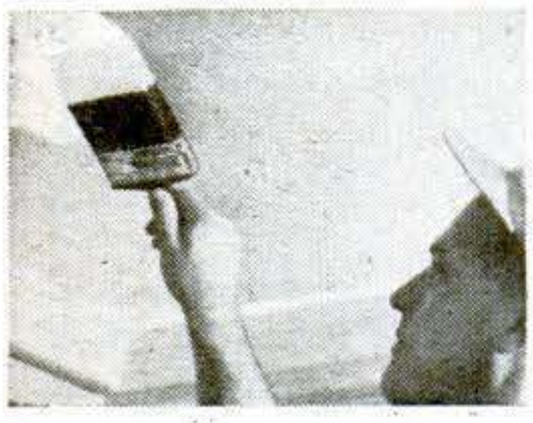
GROBAN SUPPLY CO. 1139 SO. WABASH AVE., CHICAGO 5, ILL. DEPT. PS-10

Copyrighted material

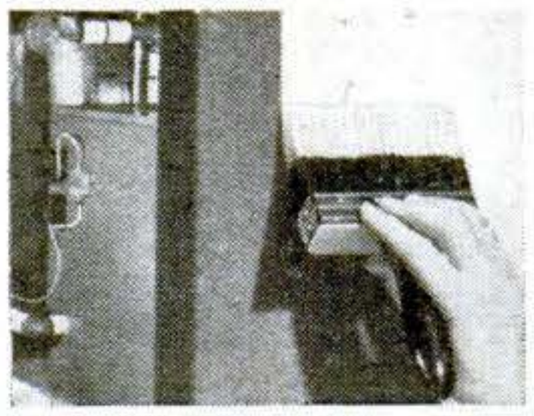
POINTERS FOR HOME PAINTERS



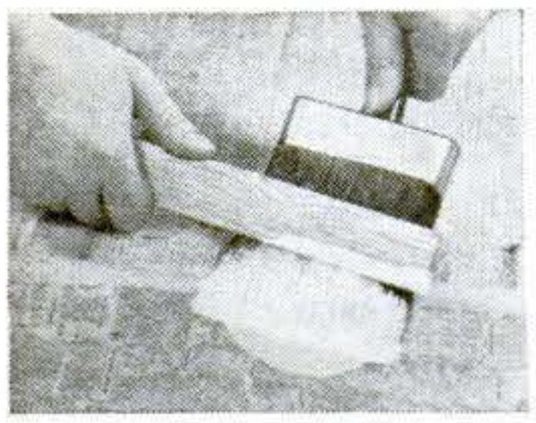
How to get better paint jobs ... make your brushes last longer



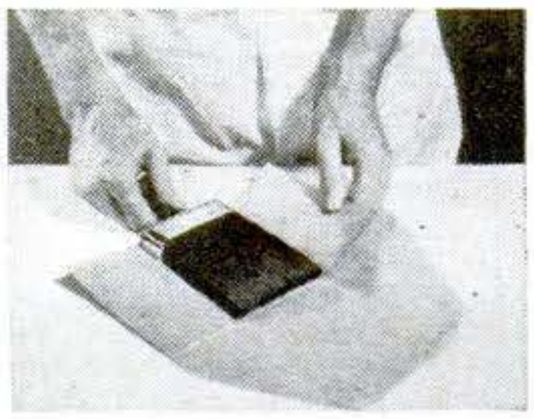
When you're painting overhead, dip brush to only one inch. Raise the brush quickly. Start in corners of ceilings. Use short, light strokes.



On rough surfaces, brush first coat in well to cover all cavities, prevent entrance of moisture. Brush second coat with smooth, even strokes.



For overnight cleaning, pour on a little thinner, work out paint on newspaper, using stick or paint scraper to squeeze out paint, suspend brush in thinner.



When you store brushes for longer periods, clean thoroughly and wrap securely in manner shown here. Brushes stay in better condition when they're kept in shape.

For best results use NYLON PAINT BRUSHES

Job after job, you'll get best results with a well-tipped nylon paint brush. Durable Du Pont nylon bristles don't break off, even on roughest surfaces. They last 3 to 5 times longer than ordinary bristles . . . paint smoother . . . are clean and sanitary. Nylon paint brushes are made by leading manufacturers in all types and sizes. Look for the word NYLON on the handle.

DU PONT
REG. U. S. PAT. OFF.
Better Things for Better Living
. . . through Chemistry

The best brushes have
DU PONT NYLON BRISTLES

GET THIS "How to do it" BOOK FREE!

PARTIAL LIST OF CONTENTS

- "Better Painting"
- "Refinishing Antiques"
- "A Superb Furniture Polish"
- "Protecting Tools"
- "Waterproofing"
- "Finishing Gun Stocks"

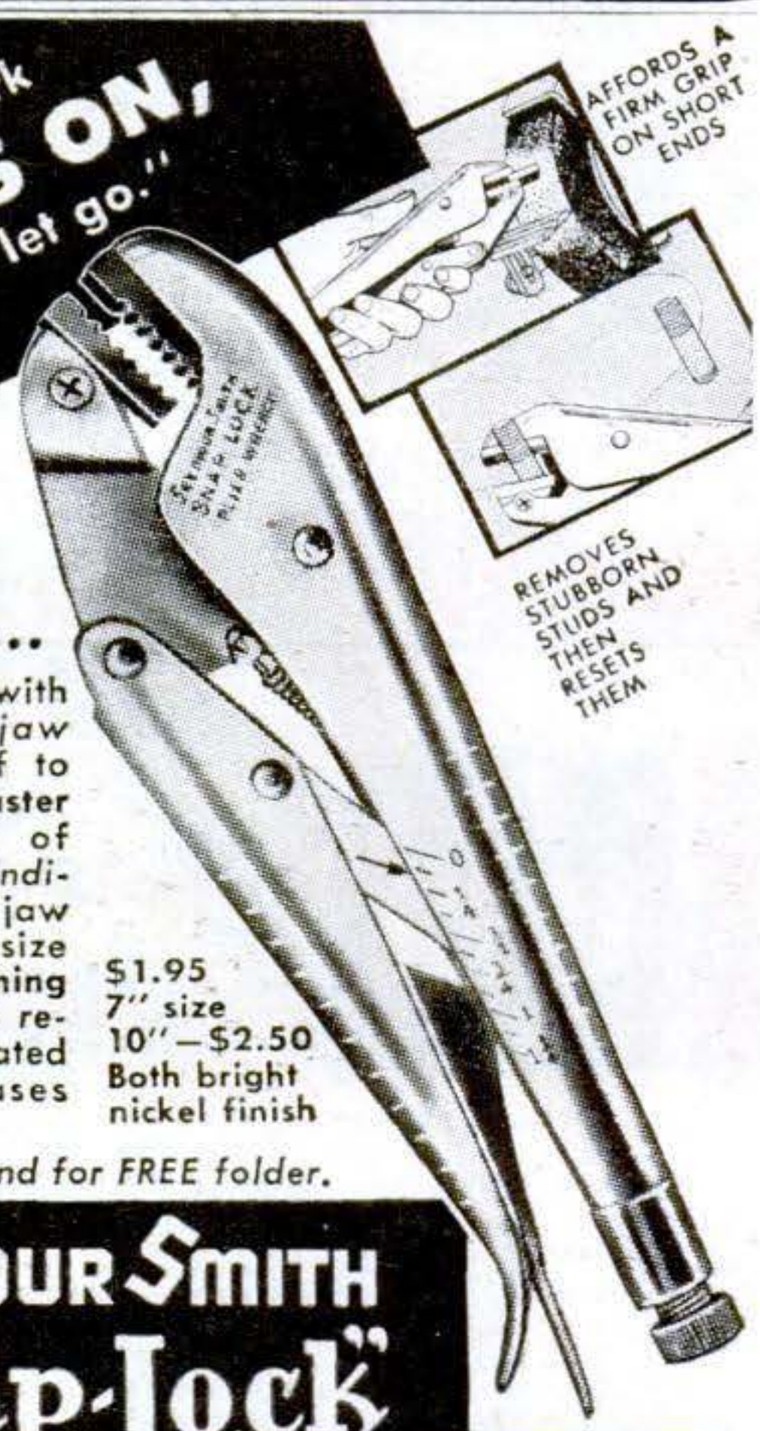
Here are 101 useful ways to use America's finest 100% pure linseed oil. Perfect for painting and the handiest item for every housewife, homeowner and farmer. Available at all stores.

EARN $2.00 EASY

We will pay $2.00 for each new practical idea for using Pol-mer-ik Linseed Oil, which is acceptable to our research laboratory. Write Archer Daniels Midland, 604 Roanoke Bldg., Minneapolis, Minnesota.

ARCHER Pol-mer-ik
100% PURE LINSEED OIL

LOCKS onto the work "HOLDS ON, after you let go."



Finest locking plier because...

Clamps on better with *patented swivel jaw* which adapts itself to shape being held. **Faster working** because of *patented jaw size indicator;* you pre-set jaw size to approximate size of object. **Easier opening** with *patented lock release;* finger-operated lever readily releases 2000 pound bite.

$1.95
7" size
10"—$2.50
Both bright nickel finish

At your dealer's. Send for FREE folder.

SEYMOUR SMITH "Snap-Lock" PLIER-WRENCH

SEYMOUR SMITH & SON, INC.
11110 Main St., Oakville, Conn.
100 years of quality tools

SEYMOUR SMITH
The Line of Quality
SINCE 1850

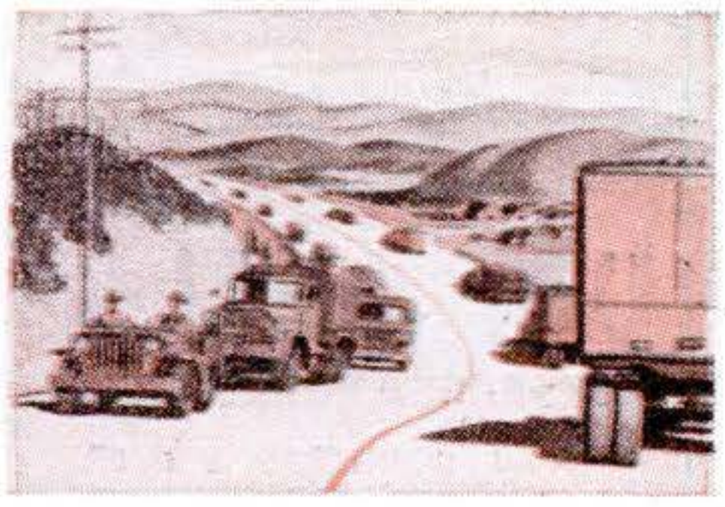
Copyrighted material

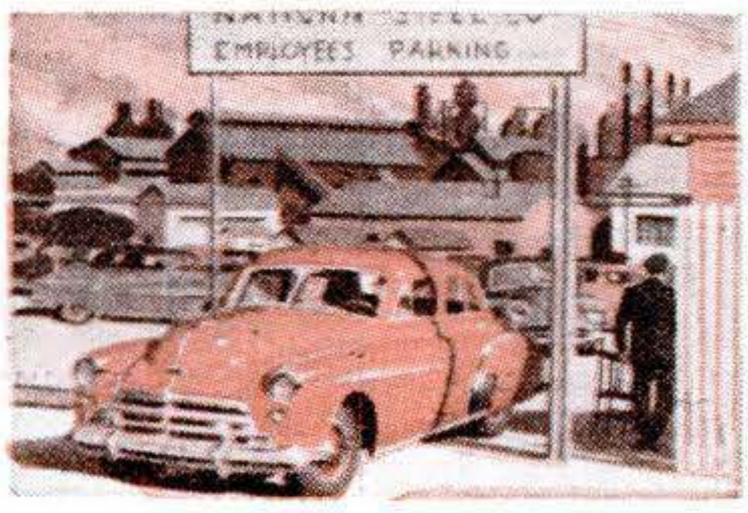
Here's Solid Evidence That

CHAMPION

SPARK PLUGS

Are Better For Your Car





Never before has America's need for dependable transportation been so great—in both military and civilian service. And never before have Champion Spark Plugs been in such great demand because of their reputation for economy, power and long life.

Quality products are always first choice—and Champions have been America's favorite for over 25 consecutive years!

CHAMPION SPARK PLUG COMPANY, TOLEDO 1, OHIO

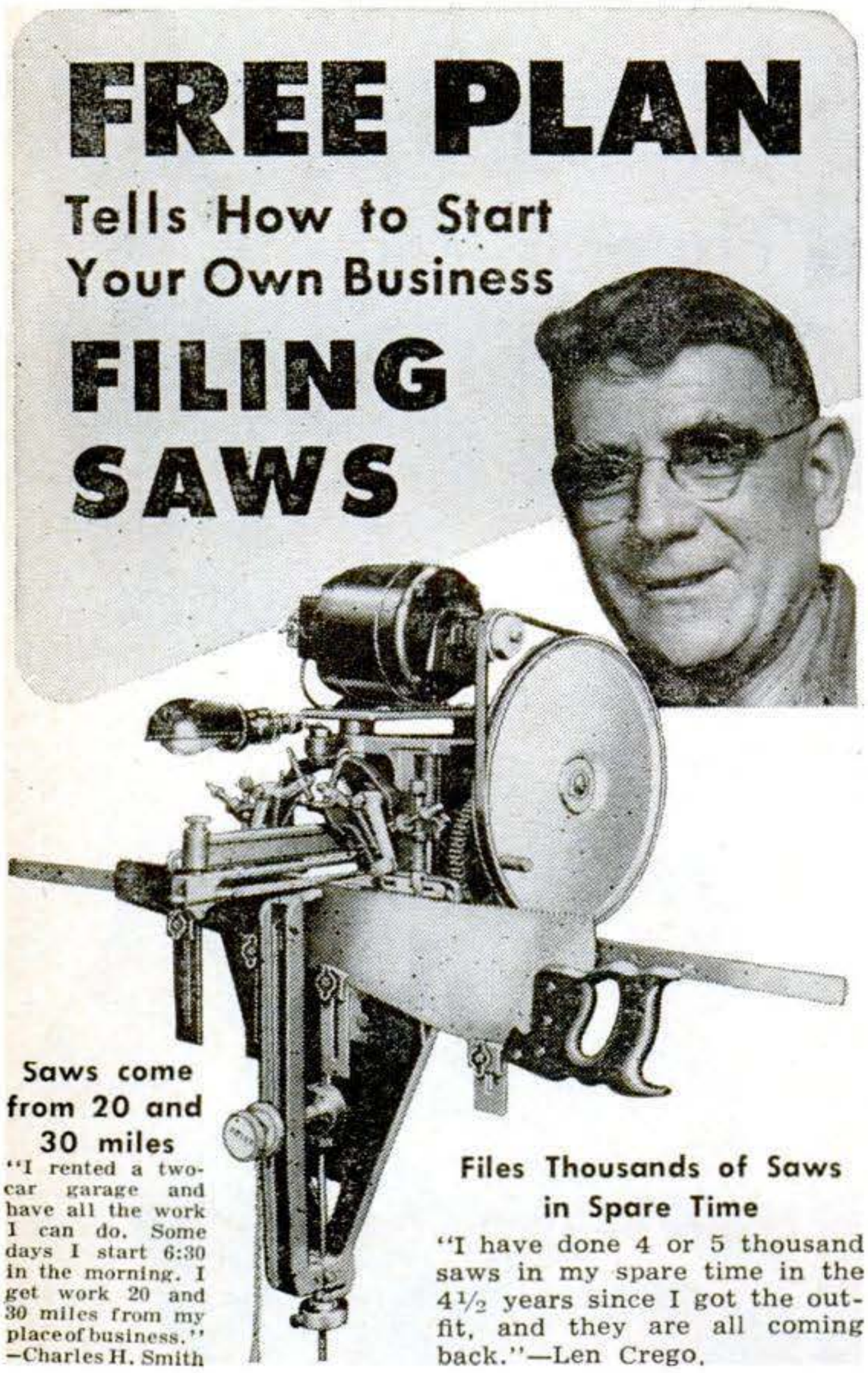
Listen to the CHAMPION ROLL CALL . . . Harry Wismer's fast sportscast every Friday night, over the ABC network

Copyrighted material

FREE PLAN

Tells How to Start Your Own Business

FILING SAWS



Saws come from 20 and 30 miles

"I rented a two-car garage and have all the work I can do. Some days I start 6:30 in the morning. I get work 20 and 30 miles from my place of business."—Charles H. Smith

Files Thousands of Saws in Spare Time

"I have done 4 or 5 thousand saws in my spare time in the 4½ years since I got the outfit, and they are all coming back."—Len Crego.

FOLEY FILED SAWS BRING NEW CUSTOMERS

Here is a steady repeat CASH business you can start in your own basement or garage in your spare time. Every saw you sharpen with the machine accuracy of the Foley Saw Filer is an ad that brings more customers. S. M. Hollingshead wrote to us: "I am doing very well with my Foley Filer, and I am glad I invested in your machinery. It is very satisfactory and works very well in the small community in which I live."

You can file all hand saws, also band and crosscut circular saws on the Foley Saw Filer. The adjustments are simple—there is no eyestrain—and you can start right away to turn out perfect cutting saws. "The first saw I sharpened with my Foley Saw Filer came out 100%. I think it is a marvel of perfection."—writes Clarence E. Parsons.

"INDEPENDENCE AFTER 40!" explains how you can get business from hardware stores, home owners, farmers, carpenters, schools, mills, factories, etc. Just think—with a modest investment, no overhead, no stock of goods to carry, you can start right in on a cash business that will help pay the rent, buy groceries, or a new car. Get the facts—send coupon today for this practical, money-making plan. No salesman will call.

Send For FREE BOOK

FOLEY MFG. CO., 1019-1 Foley Bldg., Minneapolis 18, Minn.

Send me free book **"INDEPENDENCE AFTER 40!"**

Name.....

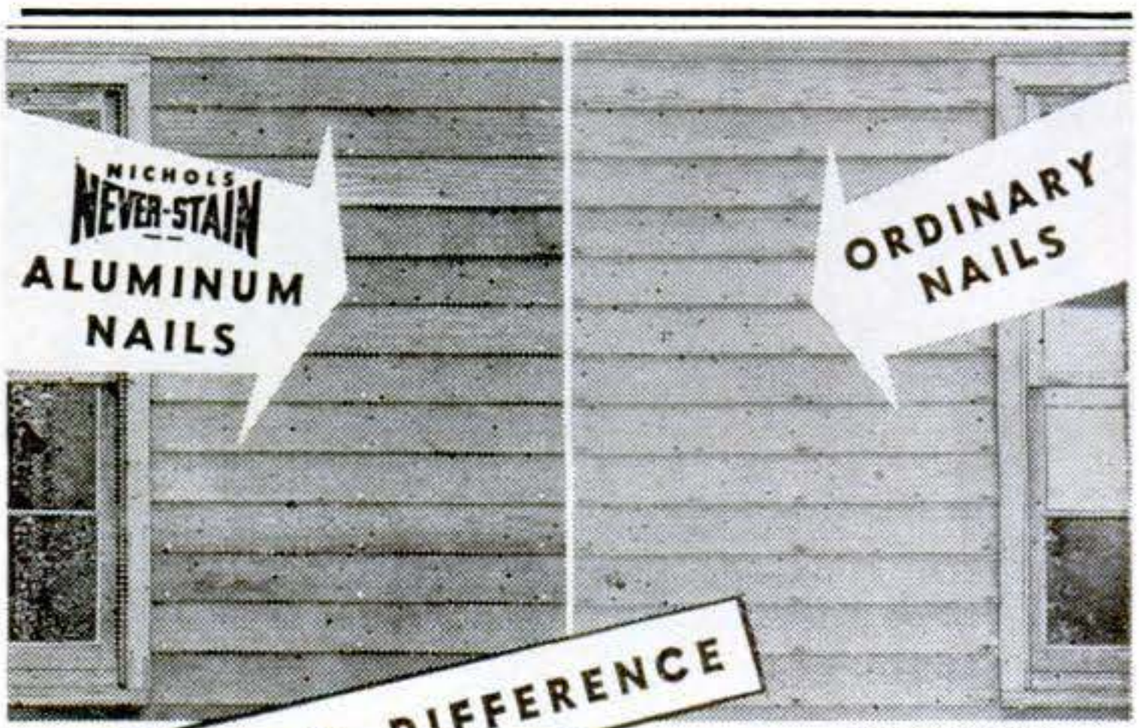
Address.....

SAVE ON REMODELING

IT'S easy and inexpensive to build an extra bedroom, bathroom, game room, photography darkroom or what-have-you with Gold Bond Gypsum Wallboard. Just nail the sturdy, fireproof panels right to lumber framework or over an old wall or ceiling. Joints can be completely concealed with Gold Bond Perforated Tape Joint System. Decorate with Gold Bond Sunflex—the one-hour wall paint, or with Gold Bond Color Texture, which goes on like paint and covers the wall like plaster. Choice of 8 brand new colors.

Available at your local Gold Bond lumber and building materials dealer!

NATIONAL GYPSUM COMPANY
BUFFALO 2, NEW YORK



ONLY NICHOLS NEVER-STAIN

ALUMINUM NAILS

OFFER ALL THESE FEATURES

- WILL NEVER RUST-STREAK OR STAIN SIDING AND SHINGLES
- ECONOMICAL TO USE—COST VERY LITTLE MORE THAN ORDINARY NAILS
- NO COUNTERSINKING OR PUTTYING NECESSARY
- EASY TO DRIVE—ETCHED FOR SUPERIOR CLEANLINESS AND HOLDING POWER

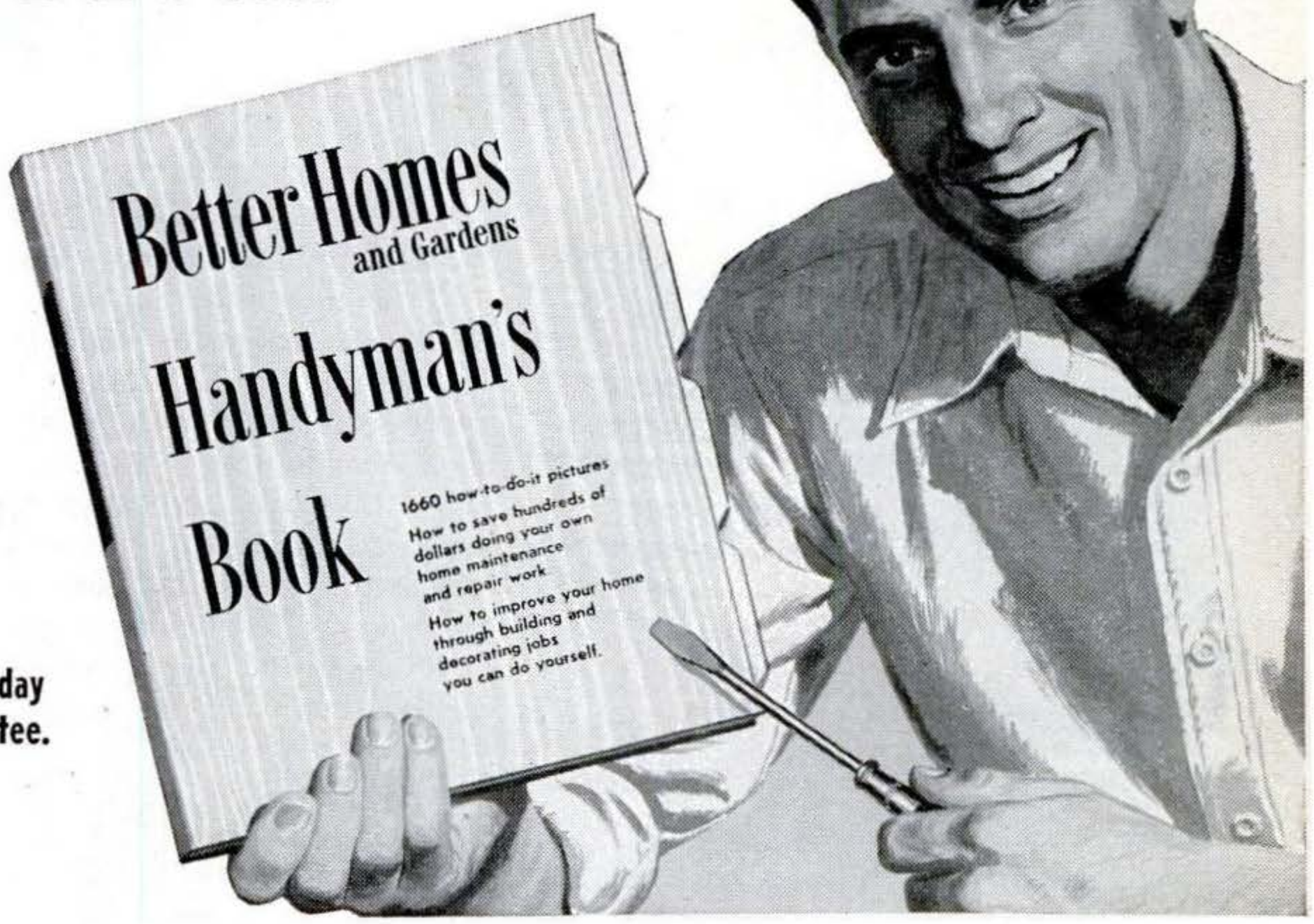
Look around your neighborhood and you'll see how ordinary nails have marred the beauty of painted siding. Never-Stain Aluminum Nails will not rust to cause unsightly streaks or stains. Billions now in use.

NICHOLS WIRE & ALUMINUM CO.
Davenport, Iowa

Copyrighted material

Save HUNDREDS of dollars and enjoy a finer home

with the practical guidance of this big new how-to-do-it book



The book that's DIFFERENT, with 1660 pictures that really show how to do each job.

Order NOW on 10-day money-back guarantee.

Only $3.95

Why pay out your good money on sky-high repair bills? You can handle those jobs as well or better yourself, with the expert know-how in this big new Handyman's Book. 14 full sections show how to:

Save hundreds of dollars doing your own home repair work.

Improve your home through easy-to-do jobs you can handle yourself.

Step-by-Step Pictures cover home-repairs and improvements, inside and out—1660 pictures that tell *and show* exactly what to do. Scores of expert short-cuts.

Amazing Value that you'd expect only from a big magazine like Better Homes & Gardens, which constantly checks best methods of home maintenance. Handsome grained cover, stamped in gold. Sturdy ring-binder and handy section-tabs make things easy to find.

Get Your Copy Now, wherever you buy books or hardware. Or order on money-back 10-day trial. Use the book 10 days. See how often it can save you many times $3.95 — or return book and get your money back. Send coupon NOW.

The A to Z of repairing and improving your home:

HEATING. How to
Reduce fuel costs
Service oil or gas
Clean chimneys, etc.

PLUMBING. How to
Open clogged drains
Thaw frozen pipes
Fix leaky faucets, etc.

ELECTRICAL. How to
Replace fuses safely
Care for appliances
Prevent "shorts," etc.

WALLS. How to
Waterproof basements
Install wall-panels
Hang wall paper, etc.

STORAGE. How to
Install kitchen cabinets
Build storage walls
Remodel closets, etc.

WINDOWS. How to
Fix broken sash-cord
Replace broken panes
Cure "sticking," etc.

FLOORS How to
Refinish floors
Repair wood or tile
Lay linoleum, etc.

EXTERIOR. How to
Use cement or brick
Repair foundation
Fix leaky roofs, etc.

FURNITURE. How to
Repair upholstering
Remove mars or dents
Use foam rubber, etc.

POWER TOOLS. How to
Use saws and drills
Use multipurpose tools
Keep safety first, etc.

HAND TOOLS. How to
Select for utility
Use for best results
Keep sharp, etc.

FASTENING. How to
Use masonry fasteners
Use solder and tape
Glue for keeps, etc.

FINISHING. How to
Remove paint, varnish
Paint walls and trim
Paint your house, etc.

LUMBER. How to
Judge lumber-grade
Salvage used lumber
Correct defects, etc.

and hundreds more, completely indexed

Money-back offer—MAIL COUPON

Better Homes & Gardens,
1410 Meredith Bldg.,
Des Moines 3, Iowa:

Please send at once my copy of your big new Handyman's Book, on 10-day trial. I enclose $3.95 — which you will refund in full if I decide to return book in 10 days, after receiving it.

Name.....

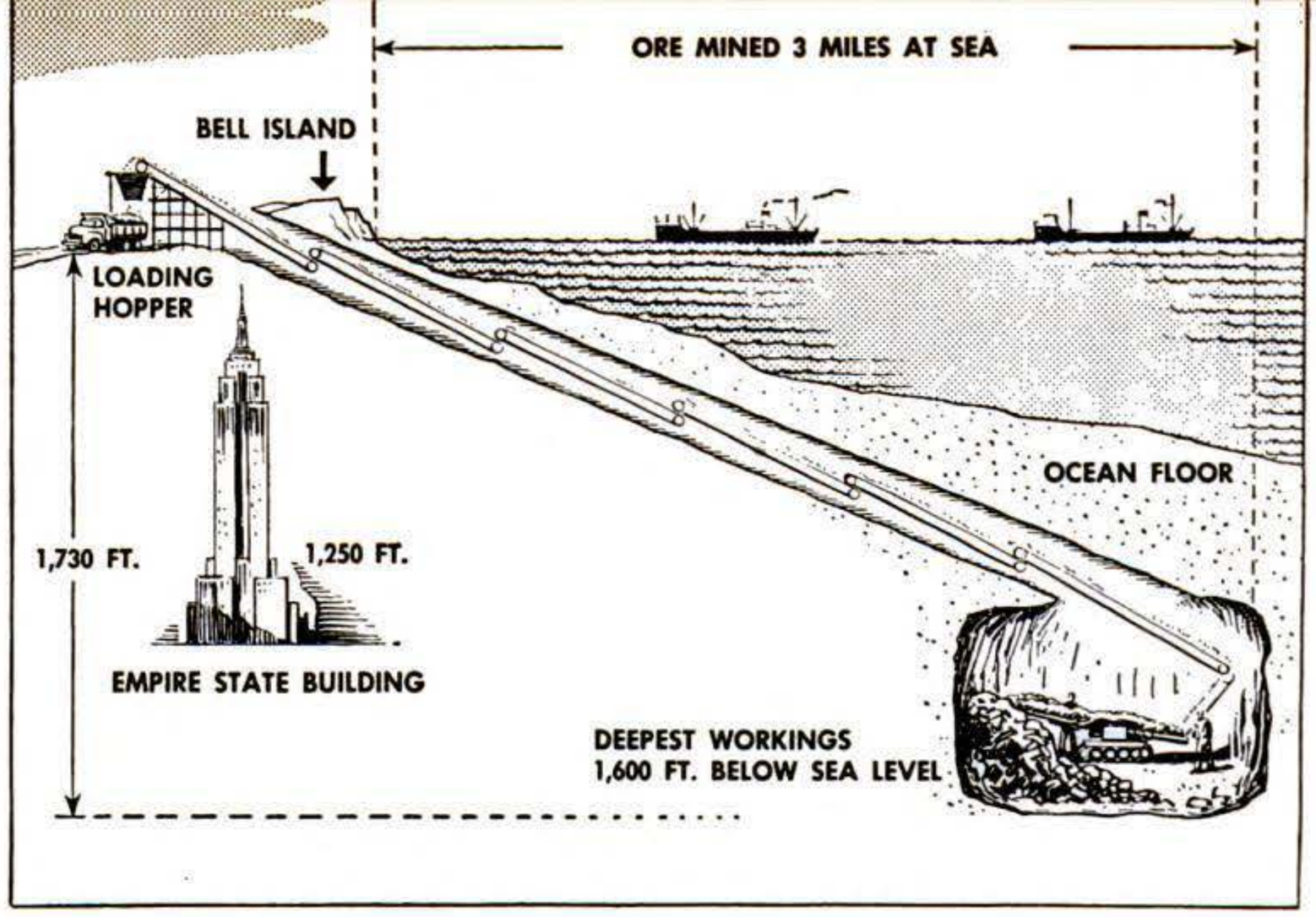
Address.....

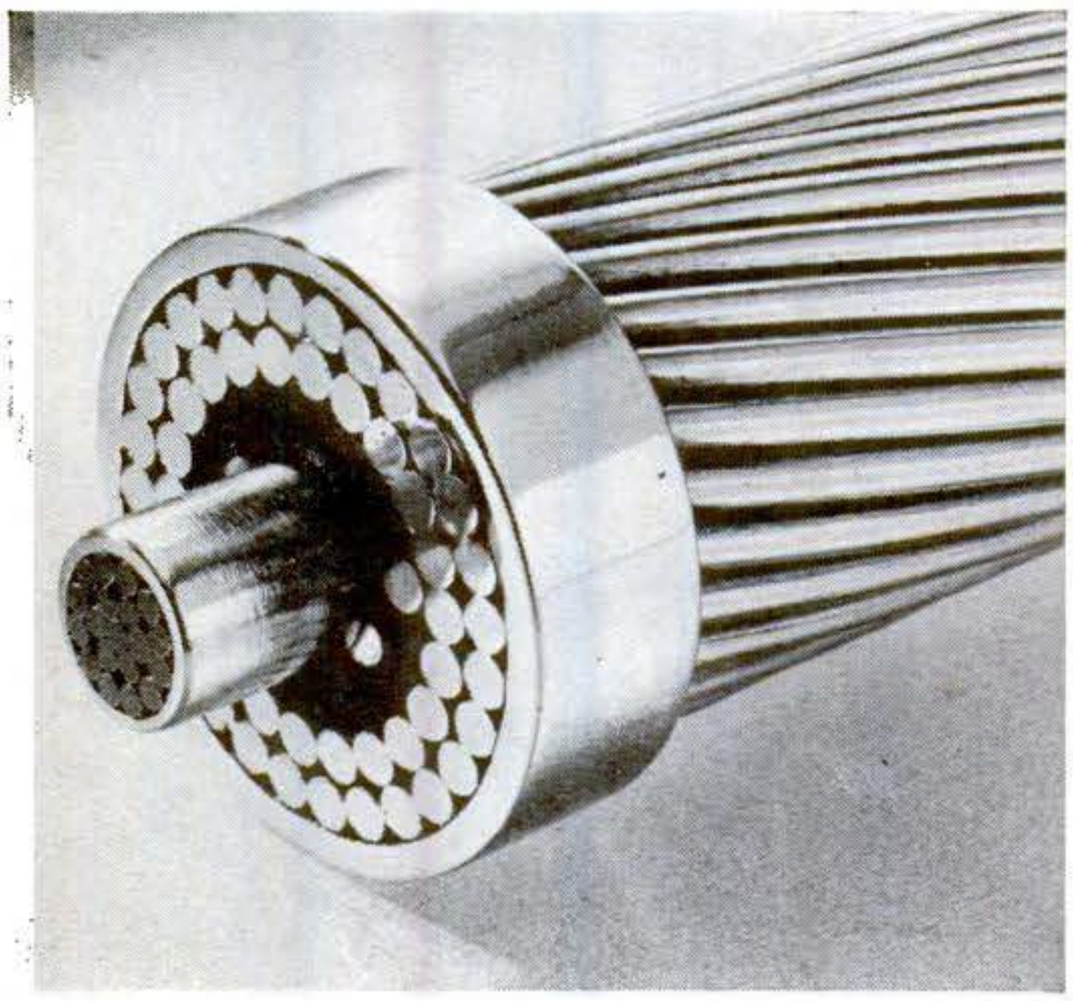
.....

Copyrighted material

2½-Mile Belt to Haul Sea Ore

THE longest and highest slope conveyor ever used will soon be installed on Bell Island, Newfoundland. It will haul iron ore up a 12,500-foot shaft from a mine 1,600 feet below the surface of the ocean. Designed by Goodyear of Canada, the 36-inch-wide belt will deliver 1,000 tons of ore an hour.





Wire Carries 330,000 Volts

THE world's largest electric cable for overhead transmission will be installed in West Virginia to carry 330,000 volts, highest ever used in America. Since current travels mostly on the surface of a conductor, the 1.6-inch wire is needed to handle the super-voltage. A 4,500-foot reel of the steel-and-aluminum wire, made by Alcoa, weighs five tons.

'Bubble' Shields Wounded

THIS new litter (below) for evacuating wounded troops by helicopter replaces the old "coffin-type" carrier in which wounded often suffered from claustrophobia. The clear-plastic hood protects a soldier from wind blast and exposure without confining him or limiting his vision. The nylon-fabric cover for the lower part of the body has pilot-controlled heater ducts. Made by Bell Aircraft Corp., the sheet-aluminum litter is easily attached to a helicopter's landing gear.

Maple Syrup Flavor Tracked Down

THAT delicate flavor and characteristic color of maple syrup is not present in the sap taken from the tree. The qualities are developed by the action of heat during boiling. Scientists at the N. Y. State Agricultural Experiment Station have proved this by preparing a batch of syrup by a new freezing method. It turned out gray in color and unlike normal syrup in taste.

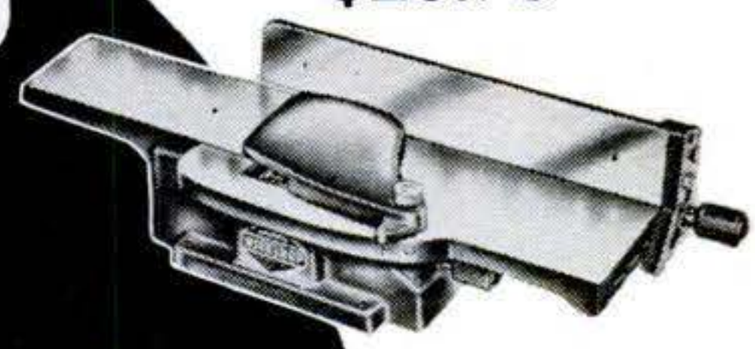
Copyrighted material

LOOK!

Atlas WORKSHOP TOOLS

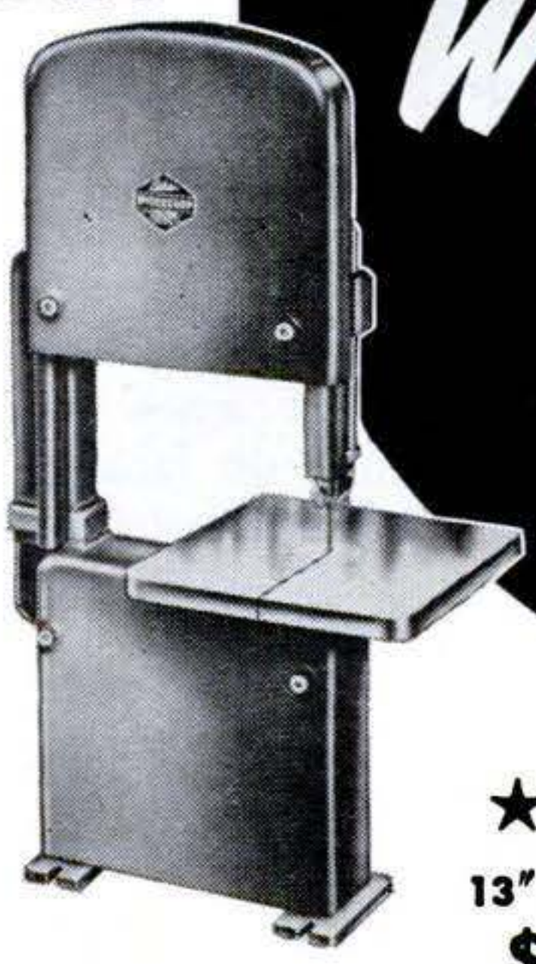
★ NEW 8" BENCH SAW
$33.95

★ NEW 4" JOINTER
$28.75

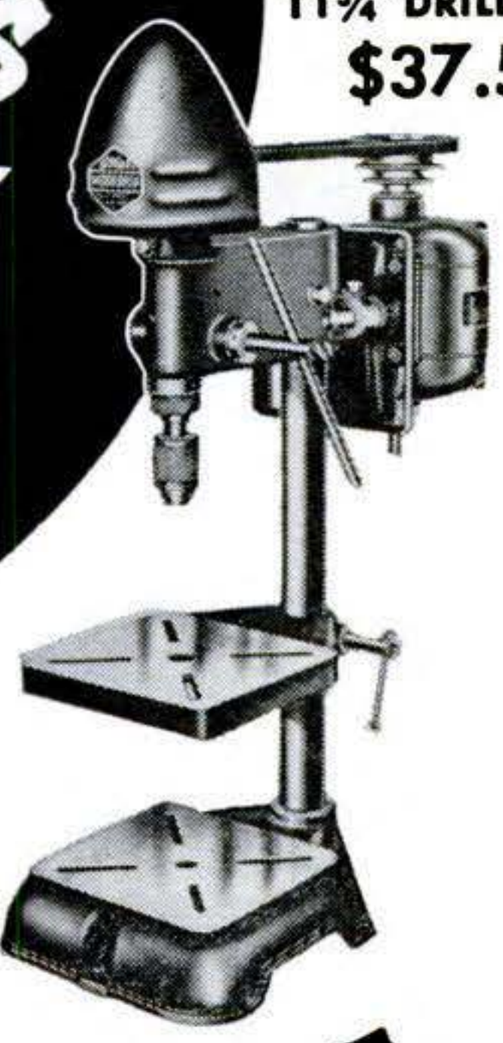


These 5 Atlas Workshop Tools FOR ONLY $161.20

★ NEW 10" BAND SAW
$42.50



★ NEW 11¾" DRILL PRESS
$37.50



★ NEW 13" JIG SAW
$18.50

ALL PRICES LESS MOTOR
F.O.B. KALAMAZOO, MICH.

– AND ALL CAN BE OPERATED FROM 1 MOTOR

★ Look at the tools . . . *look at the prices!* If you're one of those men who have long wanted a home shop equipped with fine precision tools, but haven't wanted to spend the money for large, expensive machines — these Atlas Workshop Tools will suit you to perfection. Each one is backed by 40 years of Atlas precision-engineering. They give your shop *greater* versatility at *less cost* than any tools or combination tool you can buy! — *and all 5 can be powered with 1 motor!* You'll want to see them at your first opportunity. Ask any Atlas or Atlas-Power King dealer for full details. Send the coupon for complete catalog.

SEND FOR FREE CATALOG

ATLAS PRESS CO.
1055W N. Pitcher St., Kalamazoo, Mich.
Please rush your Workshop Tool catalog.

Name_____

Address_____

City, State_____

40TH YEAR Atlas

ATLAS PRESS COMPANY
1055W N. PITCHER ST.
KALAMAZOO, MICH.

DEPENDABLE QUALITY TOOLS

Copyrighted material

For SMOOTHER MOTORING
INSIST ON
BOWES
SEAL FAST
DEPENDABLE
SPARK PLUGS
Here's Why—

★ Every Bowes Plug is Individually Tested—tested at higher voltage than is ever encountered in your car.

★ Oversize Special Alloy Electrode . . . welded construction assures positive connection.

★ Extra Large Ground Electrode assures longer life for plug.

★ Husky Aluminum Oxide Type Insulator assures against porosity—sure proof against shorting.

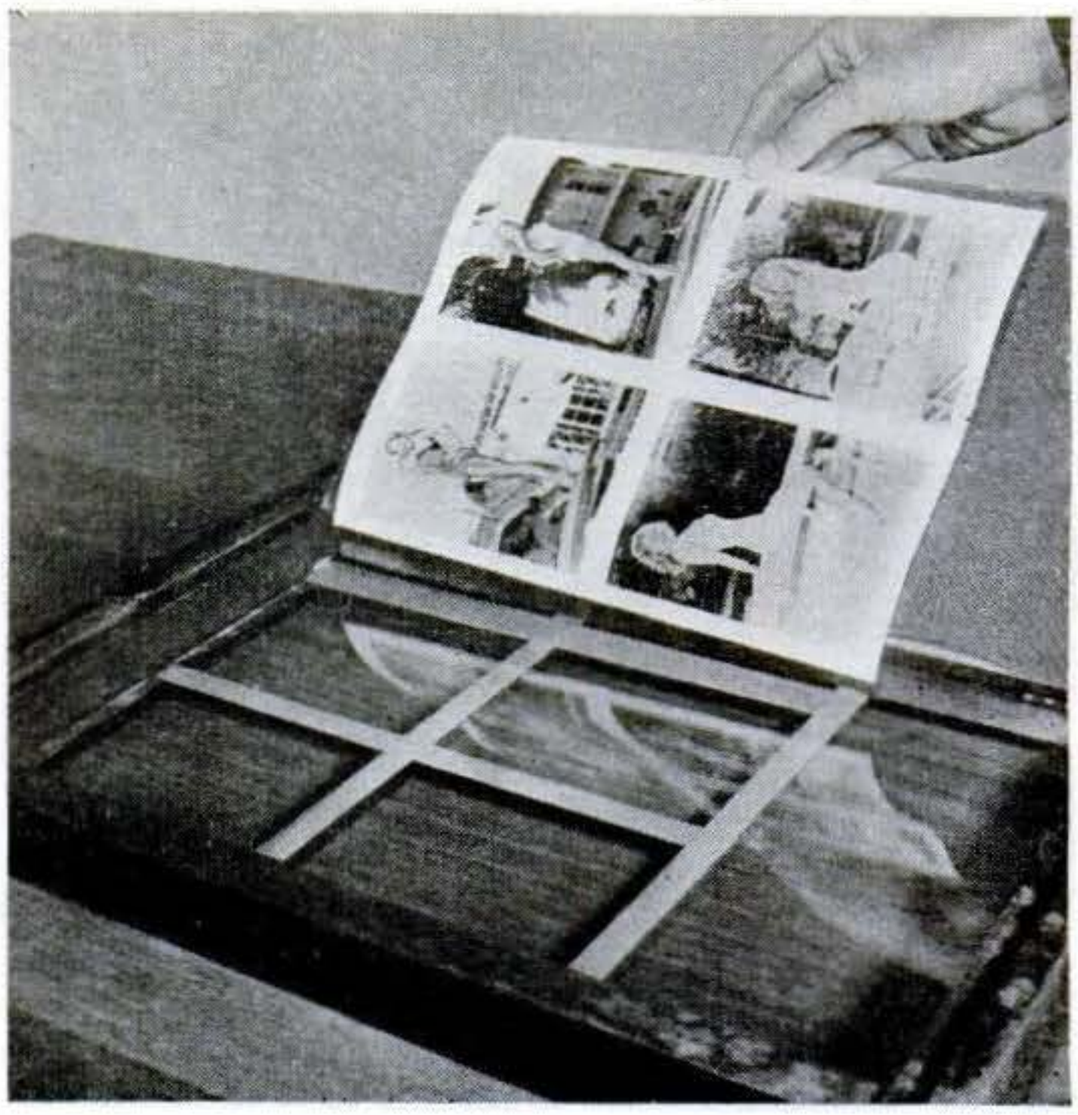
★ One-Piece, Leak-Proof Construction.

★ Patented Engine Gasket Retainer Ring assures better contact and better heat transfer.

BOWES PLUGS
are tailored to YOUR car's motor
If your favorite SERVICE STATION does not handle Bowes Spark Plugs, write us direct for further information.

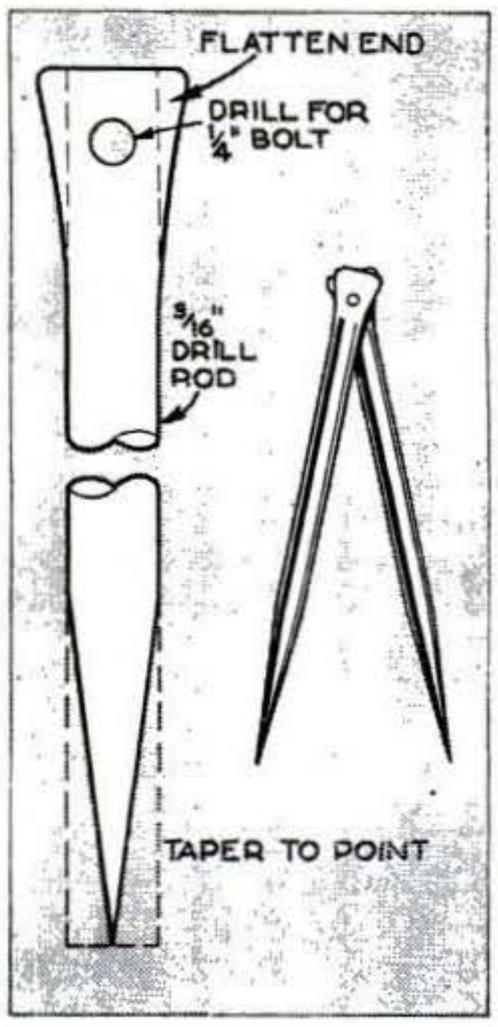
BOWES "SEAL FAST" CORPORATION
INDIANAPOLIS 7, INDIANA

Four Photos on a Single Sheet



You can make four prints nearly 4″ by 5″ in size on a single 8″ by 10″ paper by taping the contact-printer glass this way. A L-shaped piece of black paper masks out the unused portion of the paper during each exposure. Such multiple prints are good for an album.—*V. Hanson, Los Angeles.*

How to Make Dividers



My favorite dividers are a pair I made from 3/16″ drill rod. First I heated two pieces to a cherry red at one end and flattened the heated ends for about 1¼″ to a thickness of 1/16″. Then I ground long tapers and sharp points on the other ends.

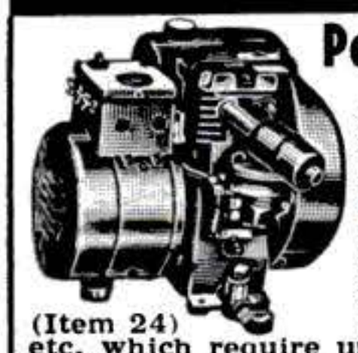
The flattened ends were drilled for a ¼″ bolt, which was held with a washer and nut. The pointed ends were next heated to redness and quenched in water. After polishing, they were reheated to a straw color. The nut adjusts joints.—*George Berkwitt, New York City.*

Old Brush Handles Fit Files

Salvage the handles of vegetable-scrubbing brushes discarded by your wife. You'll find they make excellent handles on small files.—*P. Stillwell, Anaheim, Calif.*

Copyrighted material

BUY DIRECT - MASTER MECHANIC - UP TO 85% DISC.



Portable LIGHT PLANT

PUSH BUTTON START

500-700 watts 110-120 v. — 60 cyc. A.C. Powered by a sturdy dependable, easy starting, air cooled 1¾ hp. gas engine. No wiring necessary, just plug in and operate. Plenty of current for any oil burner, freezer, brooder, pump, emergency lights, etc. which require up to 700 watts. Ideal for Civil Defense, Fire Depts; trailers & camps. Complete with Voltmeter and built-in winding to charge 6 v. auto batteries. Wt. 85 lbs. Fully guaranteed. **Be prepared if war or storm knocks out power lines.**

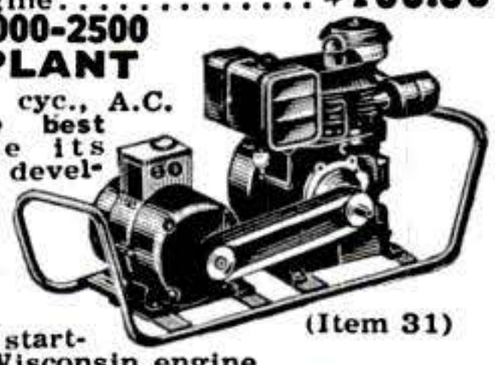
(Item 24)

Reg. $275.00 value..... **$143.50**

700-800 Watt Plant (Item 44) same as Item 24, but greater output... **$169.95**

1000-1200 Watt Plant (Item 45) same as Item 24, but larger generator & engine..... **$199.50**

GIANT 2000-2500 WATT PLANT



110-120 V. 60 cyc., A.C. **Absolutely the best made** because its heavy windings develop up to 5000 watt overload for motor starting. Skid-mounted—portable. Powered by 5 h. p. easy starting Briggs or Wisconsin engine —complete with all accessories; engine easily disconnected for other uses. Big outlet box, voltmeter, no wiring necessary. Ample current for all purposes. Factory warranty and instructions included. Wt. 220 lbs. Reg. $585.00. Special at.... **$299.50**

(Item 31)

GENERATOR ONLY and control box. Drive it with your engine or tractor **$169.50**

38 Pc. DRILL KIT

(Item 35) Includes hi-power smooth-running guar. ¼" drill, buffers, polishing bonnet, sanding discs, grinding wheels, wood bits, steel bits, wire wheels, bench stand, paint mixer, burrs. Complete in steel case. Wt. 13 lbs. 38 pc's., all highest quality. Complete kit worth $38.50. Our Spec. only... **$19.85**

ACCESSORIES FOR ¼" DRILL

Make complete workshop out of your ¼" drill, using these practical accessories. Quick change—merely insert shaft in drill chuck. Sturdy, heavy duty tools for real work. Precision built of hardened tool steel. Factory guaranteed against breakage.

POWER HACK or JIG SAW

(Item 64) makes straight or curved cuts easily in plywood, ¾" boards, sheet metal, plastics, etc. Uses broken hack saw blades. Will do filing, jig saw, coping saw and sabre saw work. Compares with $50 tools. Wt. 3 lbs. Special... **$16.95**

ELECTRIC HAND SAW

(Item 66) The famous Arco-Saw converts any ¼" or ⅜" drill into a powerful electric saw. Exclusive features—one hand operation, visual guide bevel and angle adjustments, rip gauge depth gauge. Self lubricated for life. Wt. 3 lbs. Complete with 4" blade..... **$11.50**

(Item 66)

Power Sander & Polisher

(Item 65) Make quick work of slow tedious sanding jobs. Big 21 sq. in. sanding surface. Produces powerful **lengthwise** sanding stroke which results in beautiful smooth finish. Built-in rubber pad. Sandpaper held in place by quick-change spring-clips. No messy adhesives. Use felt pad for polishing. Using drill motor for power gives you equivalent of an $85 sanding machine. Wt. 3 lbs. Terrific value at... **$16.50**

FIRE EXTINGUISHER

(Item 39) Fully charged (at 1,000 lbs. P. S. I. or more) with CO_2 (carbon dioxide), the proven miracle fire fighting chemical that smothers oil, gasoline and electrical fires. Play safe; keep one in your car, garage and home. Heavy ICC approved steel cylinder, valve and 3000 lb. gauge that shows available remaining pressure. REFILLABLE at nominal cost. Hose included for emergency tire inflator or air blast. Wt. 4 lbs. $19.50 value. Special..... **$6.95**

LARGE FIRE EXTINGUISHER

(Item 57) commercial size, 5 x 14 in. (275 cu. in.) heavy ICC approved steel cylinder charged at 1000 lbs. or more with CO_2. Equipped with genuine Kidde Valve. Refillable. Hose incl. Suitable for fire depts., stores, garages, homes, etc. Wt. 18 lbs. $42.50 value. Spec.. **$15.85**

HEAVY DUTY ARC WELDER

(Item 38) Use as portable or shop welder. 250 amps, D.C., Senior model. Made for years of trouble-free, continuous service. Will handle light or heavy jobs. Weld up to ½" plate using ¼" rods. Built-in air-cooling system. Arc is easy to strike and hold, because of specially designed arc stabilizer. Hi-lo switch and dial control gives wide range of welding heats. Run welder at 2600 rpm. with tractor, jeep or 10 hp. gas engine, or 7 hp. elec. motor. Complete with instructions, guar. and double V belt or flat pulley. Wt. 110 lbs. A $400 value at..... **$99.75**

MAGIC TERMINAL model same as above but with built-in 3rd terminal for low heat soldering and brazing. Special..... **$119.50**

WELDING KIT. Two 10 ft. leads, welding helmet, electrode holder, ground clamp. Sold only with welder at.... **$10.50**

28 pc. BENCH GRINDER KIT

(Item 71) A rugged precision Grinder powered by ¼ hp AC 110 v. 3500 rpm heavy duty motor. Equipped with tool rests and non-breakable safety eye-shields. 28 pc. kit incl. 2 grinding wheels, wire wheel, drill chuck, arbor, asst'd drills. 14 sanding and polishing discs, buffs, etc. All highest quality. 1 year guar. Wt. 17 lbs. Drastically reduced..... **$21.95**

CARRY-AIR

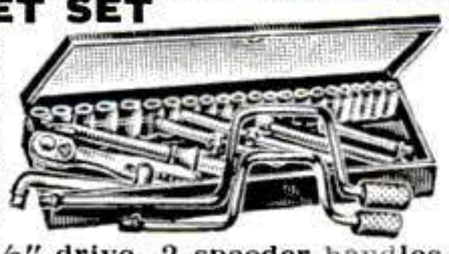
(Item 32) Stainless steel tank—capacity 500 cu. in. at 400 lbs. press. complete with inlet and shutoff valves, press. gauge, detachable air hose, tire chuck. Fill at any service station. Carry air for tire inflation, blowing out lines, spray painting, insecticides, etc. One emergency pays back cost. Wt. 10 lbs. Worth $20.00. Our price..... **$8.95**

(Item 55) With big double tank (1000 cu. in.)..... **$11.95**

POTTERS WHEEL

(Item 47) Complete, prof. equip. for making finest ceramics and pottery. Large dynamically balanced cast-aluminum reversible turntable with variable speed drive (38 to 140 rpm) controlled by foot-pedal. Built-in adjustable arm rests, water cup and wedging wire. 16x12" enclosed throwing table—ample area for largest pieces. Req. ¼ hp. motor (not incl.). Can be set up on 20x24" table and stored on edge. Complete with pulleys, belts and instructions. Wt. 26 lbs. $145 value at..... **$59.95**

32 pc. SOCKET SET



(Item 59) Highest quality guar. non-breakable sockets made by Plomb, Snap On, etc. Complete range of 22 sockets from ¼" thru ¾" in ⅜" drive and 7/16" thru 1-1/16" in ½" drive. 2 speeder handles, 2 extensions, 2 slide heads, double ⅜ x ½ in. "L" handle, reversible ratchet, 12" Phillips type screw driver and metal tool box. For professional mechanics who want the best. Wt. 14 lbs. Easily worth $32.50, while they last..... **$15.95**

RUBBER HOSE

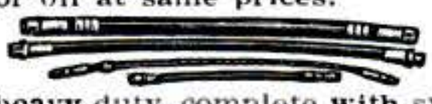
TERRIFIC VALUES!

New genuine Neoprene Hose — outlasts ordinary rubber 3 to 1. Reinforced with super tough cotton cord plies. Flexible. Easy Flo brass couplings with standard pipe threads for quick connections, included. Pump water for irrigation, **stock tanks, home, barn, fire fighting, etc. Pump Gas or Fuel Oil.** Save more than 60%.

(Inside Diam.)	1"	1¼"	1¼"	1½"
Length	10 ft.	25 ft.	40 ft.	30 ft.
Price	5.95	9.25	14.75	14.75

If specified we will send special hose for gas or oil at same prices.

HYDRAULIC HOSE



High pressure, heavy duty, complete with swivel fittings. Pipe thread connections. Ideal for farm equip., bulldozers, grease guns, airbrakes, etc. Any length. Minimum $1 per lgth. INSIDE DIAMETER, ¼" **50¢** per ft. ⅜" **60¢**. ½" **80¢**, ⅝" **90¢**.

EXTENSION CORD

(Item 16) 40 ft. **heavy duty,** made of specially insulated No. 14 2-conductor wire. So tough that you can drive over it and yet amazingly flexible and easy to handle. Resists oil, grease or water. Extends electricity up to 400 ft. without voltage drop. Use indoors or out. Complete with heavy rubber plug and outlet. Wt. 2½ lbs. Usually $1.50—Special 40 ft. **$1.99**

Comb: 2-40 ft. and 1-20 ft. (total 100 ft.) **$4.95**

100 foot length (one piece)..... **$4.85**

WIRE ONLY (Item 50) No fittings, 100 ft. **$4.00**

TRENCH-LAY WIRE. (Item 51) **Anaconda** #10—2 cond., for buried service to barns, outdoor lights, etc. Absolutely impervious to soil and moisture. Wt. 25 lbs. per 100 ft. Special surplus price. 100 ft. coils, **19¢** per ft.; 250 ft., **18¢** per ft.; 500 ft., **17¢** per ft.

POWER CABLE (Item 67) #12—2 cond. stranded, flexible, vinyl covered, impervious to everything. 50 ft. wt. 7 lbs..... **$15.95**

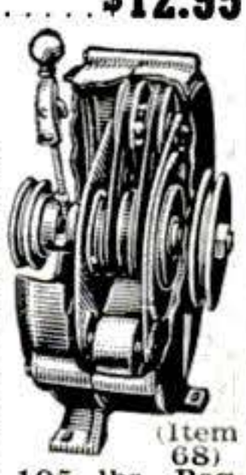
HEATING & VENTILATING FAN

(Item 10) Easily installed in furnace pipes. Forces even heat to all rooms. Over range, removes kitchen smoke and odors. Powerful continuous duty motor, 110-120 V. A.C. Quiet, super efficient fan moves huge volume of air (400 to 600 c.f.m.) 8" Fan, wt. 5 lb. **$6.35**; 9" Fan, wt. 6 lbs. **$7.45**; 10" Fan, wt. 7 lb. **$8.45**; 12" Fan, wt. 8 lbs. **$9.45.**

HIGH PRESSURE HAND PUMP

(Item 53) Positive displacement type. Cap. 550 gph. Completely self priming. ¾" pipe thread inlet and outlet. Use for fuel or water transfer on boats, trailers, air craft, etc. Ideal for insecticides, emerg. sump pump or as vacuum pump. Wt. 15 lbs. Govt. cost $95. Our Special..... **$12.95**

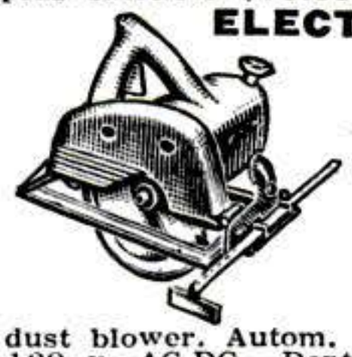
VARIABLE SPEED SELECTOR



Heavy duty, made by **B. F. GOODRICH** for industrial use. Provides instant speed changes for any drive. For machine tools, dryers, printing, conveyors, production lines, hoists—any operation requiring variable speed. Ideal for midget autos. Employs reliable "trouble free" planetary system. No hydraulic power losses or creeping. Infinite range, smooth operation, easy installation. 3 sizes: ½-1 hp. wt. 36 lbs; 1-2 hp. wt. 55 lbs.; 2-3 hp. wt. 105 lbs. Reg. list $228, $252 and $352. Brand new, in Goodrich boxes and guaranteed. Complete installation data included. Unprecedented surplus sacrifice **$79.50, $89.50** and **$114.50.**

(Item 68)

ELECTRIC HAND SAW



(Item 36) Most perfectly balanced and smoothest running saw made. Advanced design provides max. power and light weight. Easily adjusted for all angles, depth and width of cut. Comes complete with 6¼" comb. blade, ripping guide and 10 ft. hvy. duty cord. Built-in saw-dust blower. Autom. telescoping guard. 110-120 v. AC-DC. Depth of cut 2¼". 1 year written guar. Wt. 12 lbs. Drastically reduced..... **$39.95**

GAUGE TESTER

(Item 27) Precision made of solid bronze and steel by Ashcroft. (Cat. #1300-5). Calibrated weights (incl.) acting against hydraulic piston provides quick accurate testing of all pressure gauges up to 500 psi. Brand new. Wt. 90 lbs. Reg. $318.00. Our Spec..... **$95.00**

8" TILTING ARBOR SAW

Terrific Value. Heavy duty ⅝" double ball-bearing arbor. Saw blade tilts, table remains level. Big 12"x16" precision ground table. (Extensions to 24"x16" avail.) Micrometer hand wheel controls tilt and depth—2½" cut. Cross-cutting, ripping, dadoing, sanding, bevel and angle cutting, all easily performed. Essential for all cabinet work. Motor carriage, mitre-gauge, rip-fence, splitter, guard and blade incl. Compares with saws selling at $89.50. DeLuxe Ball-Bearing model (Item 69) wt. 34 lbs..... **$44.95**

Bronze-bearing model (Item 70) ½" arbor, table 10"x13", wt. 34 lbs.... **$27.50**

MANUFACTURERS AND JOBBERS — Write us about your surplus items

All items *brand new*. Prices f.o.b. Chicago area. 10 day Money back guarantee. Send check or M. O.

MASTER MECHANIC MFG. CO., DEPT. 74 Burlington, Wis.

Copyrighted material

Burden's Gigantic Fall MAIL SALE

Midwest's leading surplus firm offers, subject to prior sale, a $650,000.00 inventory of new perfect condition:

• WAR SURPLUS • EXCESS INVENTORY • BANKRUPT STOCKS

During Sale We Will Pay All Shipping Charges!

Power Plants and Generators

- **Kato Generators.** 115-V, 60-C, 5000-Watt, 1800 R.P.M. Single Phase. Ball bearing. Complete with control panel. Cost over $550.00 ..... **$259.50**
- **Onan Plants.** 115-V, 60-C, 5000-Watt, 4-cyl. engine, complete control panel. Push button start. Cost over $1,200.00 ..... **$715.50**
- **Homelite Plants.** 115-V, 60-C, 1500-Watt, 1-cyl. engine. Complete. Exceptionally fine. Cost over $450.00 ..... **$258.70**
- **Homelite Plants.** 115-V, 400-C, 1400-Watt, 1-cyl. engine. Fine for lights, irons, heaters, but not motors. Cost $630.00 ..... **$129.60**
- **Burdex-Briggs Plants.** 115-V, 60-C, 2000-Watts, 1-cyl. engine. Excellent size for home emergency power. List $585.00 ..... **$297.50**
- **Delco-Remy Generators.** 25-30 Volt, 200-amp. Direct current. Makes excellent welder (full instructions for building), also fine for emergency lights, power, etc. Cost over $250.00 ..... **$19.95**
- **A-C Plants.** 115-V, 60-C, 7.5 KW **$691.70**
- **A-C Generators.** 115-V, 800-C, 1 KW **$18.96**
- **D-C 6-Volt Wind Driven Generator** outfit, complete **$33.95**

AIR COMPRESSOR EQUIPMENT

Paint, blow up tires, clean gas lines with compressed air. Build your own portable hi-pressure unit.

- **Basic Compressor Kit.** Finest 1-cyl. piston comp., stainless steel storage tank, 160 lb. gauge, paint gun, blow gun, fittings, tire chuck, hose, relief valve, inst. for portable unit **$39.90**
- **Air Components.** 1-cyl. compressor .... **$19.95.** 2 cyl. comp. **$49.50.** Automatic pressure switches (on 50, off 75) .. **$4.95,** pressure regulator (0-150 lb.) .. **$2.65,** gauges (60, 100, 160 lb.) .. **$1.89,** tanks (small **$5.60,** large **$9.95**), air hose, 20' 1/4" with fittings .. **$2.89,** adj. safety valve .. **$1.95,** top quality paint gun, **$8.95,** 3-gal. paint tank **$18.95**

WINCHES, CLUTCHES—ENGINES—BLOCKS

- **Heil Power Winches.** Heavy duty 15,000 lb. with clutch and 150' 1/2" cable. Cost $275 ..... **$169.70**
- **DeLuxe Hand Winches.** Dual ratio 1-3, 1-9. Finest construction. Powerful 3,000 lb. 100s uses, farm & business **$29.87**
- **Truck Hand Winches** 1-3 ratio, 2,000 lb. Excellent for loading trucks, Contractors, etc. Top quality **$19.77**
- **Utility and Boat Winches** 1-4 ratio, 1500 lb. **$18.97**
- **Double Sheave Blocks.** All steel for rope, 5", Pr. ..... **$ 7.76**
- **Snatch Block.** 4" steel, 3000 lb. **$5.49**

Water Pumps—Water Systems—Weed Spray Units

- **Automatic Pressure Water System.** Leading make. For farms, cabins, etc. 110-volt 60-cy. 300 g.p.h. 22' lift **$69.50**

- **Bronze Medium Pressure Rotary Pumps.** Up to 25 lbs. Stainless shaft. Self priming. Lift 10' without foot valve, 22' with. Efficient.
  1/2" 6 g.p.m. **$12.95**
  3/4" 10 g.p.m. **$16.95**
  1" 19 g.p.m. **$22.95**
- **Bronze High Pressure Rotary Pumps.** Up to 150 lbs. Stainless shaft, self priming. Lift 10' without foot valve, 22' with. Top quality unit. Move 1/2" 5 g.p.m. **$14.50,** 3/4" 8 g.p.m. **$20.95,** 1" 17 g.p.m. **$27.95**
- **Centrifugal Irrigation & Flood Pumps.** Cast iron-bronze, stainless shaft, 7500 gal. per hr. 2" suc. 1 1/8" dis. Ball bearing **$34.79**
- **• • • • All Brass DeLuxe Tractor Weed Spray Outfit.** Popular make at over 40% saving. Consists 4-row brass boom with genuine T-jet 5 g.p. acre, nozzles, easy mount any tractor, gauges, valves, hose, direct drive tractor pump, relief valve, etc. A guaranteed value **$84.50**

MISCELLANEOUS CLOSE-OUT EQUIPMENT BARGAINS

Limited quantities. Order promptly to get in on these.

- **• • G.E. Dictation Magnetic Recorders.** 110-v, 60-c. For home or office. Records over and over. Brand new with tubes **$29.50**
- **Rural Magneto Phones.** Wall type. Modern case, 5-bar **$12.40**
- **Private Magneto Phones.** Wall type. Modern, 3-bar **$10.25**
- **City Up-Right Desk Phones.** Many uses. Instructions ..... **$ 1.99**
- **Motor-Gyro Units.** 24-v, D-C (will run on A-C) fascinating **$ 1.98**
- **Direct Reading Tachometers.** 0 to 4000 R.P.M. Leading make **$ 6.79**
- **G.E. Arc Welders.** Complete outfits, 220-v, A-C **$139.50**
- **• • • • DeLuxe Farm-Business D-C Arc Welder.** Will furnish up to 250 amperers of voltage stabilized smooth welding current. Complete with driving pulley, instructions, etc. Ready to use **$99.50**
- **• • • • Buy of the Month. Guy Cable-Turnbuckle Units.** 12 ft. flexible steel cable, 14" turnbuckle. Fine for guying television antennas, strengthening gates, bldgs., etc. cost $1.10 ..... 10 for **$ 3.89**

WIND DRIVEN POWER PLANTS

- Ideal for lights, radio, battery charging. Fine for remote camps, farms, etc.
- Complete, 6-volt, 30-amp. d-c generator, 7-ft. propeller, relays, 6-ft. steel tower, etc. Brand new. Original cost $95. SALE **$33.95**

BURDEN'S 30-Year Policy: • Everything guaranteed perfect. • We pay all shipping charges in U.S.A.

ORDER FROM AD or Write for Free Catalog!

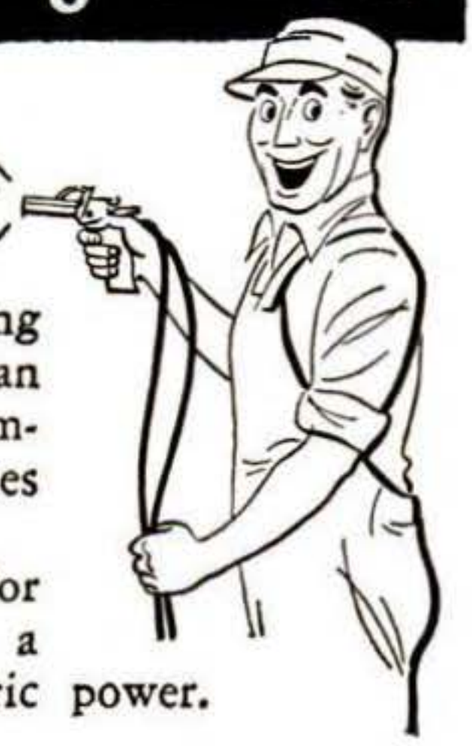
FREE CATALOG

BURDEN SALES COMPANY

832 "O" ST. LINCOLN, NEBR.

CAMPBELL-HAUSFELD Spray Painting Outfits

Outperform them all!



DO more and better painting in an hour than you can brush on in a day. Same compressor inflates tires, lubricates cars, tractors, implements.

4 models, precision built for trouble free service. Last a lifetime. Gasoline or electric power.

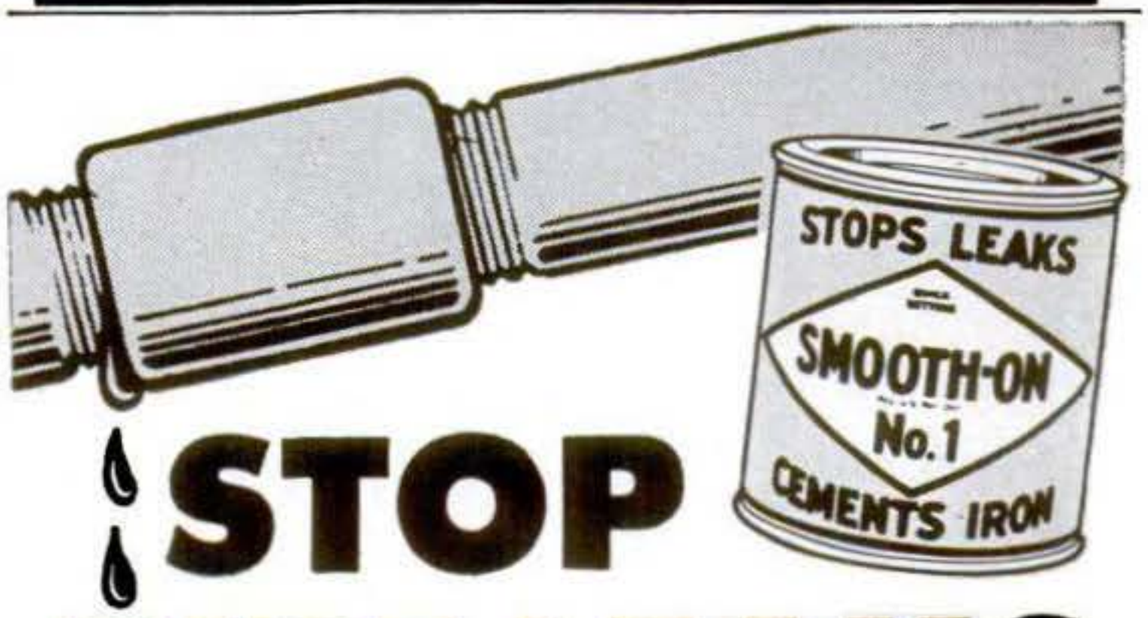
See them at your dealer or write for literature, giving his name.

pressure maid

New Low Priced Pressure Maid . . . dwarf in size . . . giant in power.

THE CAMPBELL-HAUSFELD CO.

151 RAILROAD AVE. HARRISON, OHIO



STOP PIPE LEAKS

with Smooth-On No. 1 Iron Cement. For over 50 years a home repair stand-by for stopping steam, water, oil and gas leaks in boilers, furnaces, tanks, stoves, etc. and for tightening loose parts. Get a 1 3/4 oz., 7 oz., 1 lb. or larger size at your hardware store and keep it handy.

FREE 40-PAGE REPAIR HANDBOOK

Shows many useful repairs you can easily make around the house and on the car. 170 pictures. Write NOW for free copy.

SMOOTH-ON MFG. CO., DEPT. 58KA
570 Communipaw Ave., Jersey City 4, N.J.

SO 362

Do it with **SMOOTH-ON**

THE IRON CEMENT OF MANY USES

Copyrighted material

Now YOU can do it!

Your bathroom or kitchen can have that smart, modern look with . . .

"INSTALL IT YOURSELF"

VIKON METAL TILE

VIKON TILE Is Economical . . . Easy To Install

Here's how to put new life and sparkle into drab, colorless rooms . . . quickly and inexpensively . . . with Vikon Metal Tile . . . do the entire job yourself in your spare time! It's ideal for walls and ceilings of kitchens, bathrooms, showers, laundry rooms, utility rooms and game rooms.

You have 30 beautiful fade-resistant decorator colors to choose from in both steel and aluminum . . . also stainless steel.

Look at these features:

- *Will not warp, chip or craze*
- *Resists heat and ordinary household chemicals*
- *Fireproof, waterproof, a seal against insects*
- *Can be bent for corners or cut to fit special needs*
- *Easy to keep clean*

STEEL · ALUMINUM · STAINLESS STEEL

VIKON TILE

BEAUTY · ECONOMY — COLOR FUSION METAL — DURABILITY

"The Original Individual Metal Tile"
Established 1926

FREE SAMPLE and COLOR BROCHURE

Send today for your free copy of Vikon's full-color, descriptive brochure and sample of tile. You be the judge of its quality and adaptability to your home. No cost or obligation involved. Simply fill out and mail the coupon.

VIKON TILE CORPORATION
WASHINGTON, NEW JERSEY, DEPT. PS-1

Please send me without cost or obligation, a full-color, descriptive brochure and sample of Vikon Tile.

Name . . . . . .
(Please Print)

Street Address . . . . . .

City . . . . . Zone . . . . . State . . . . . .

VARIABLE SPEED HYDRAULIC POWER TRANSMISSION

It has Infinite Speeds 0 to 550 Reverse Automatic Overload Protection; Adjustable Torque up to 180 inch pounds. 5/8" Input and Output Shafts. It will handle 1/4 to 1 1/2 H.P. Motor. Case measures 7 1/2" long 7" high 6 1/2" wide. VALUE OVER $300. Shipping Wt. 25#. On C.O.D. Orders we require a 10% Deposit.

only **$54.50** Fob. Chicago

DIRZIUS MACHINE SHOP "S" 1423-25 So. 52nd Ave., Cicero 50, Ill.

Ask Your Hardware Store for
FULLER'S
Unbreakable Amber Handle
SCREW DRIVERS

America's most popular line of moderately-priced screw drivers! Wide range of sizes.

FULLER TOOL CO., Inc., 911 Faile St., New York 59
World's largest maker of Amber-Handle Tools

SAVE THREE WAYS WITH A NEW Cushman

WRITE FOR FOLDER AND PRICES

DEPT. 20-S

Get the big three Cushman economies—low purchase price, low operating cost, low maintenance. Ride the Cushman scooter to work, school or shop. Less than a penny per mile to operate. Dealer inquiries invited.

CUSHMAN MOTOR WORKS Lincoln, Nebr.

Copyrighted material

NEW DREMEL *Electric*

RAZOR BLADE SHARPENER

GUARANTEES

100 SHAVES FROM ONE BLADE

. . . Gives You The (Pat'd)

SMOOTHEST SHAVES YOU EVER HAD!

Only $9.85

DOUBLE-EDGE BLADES ONLY

The Dremel Sharpener guarantees a sharp, fresh blade *everytime you shave.* What's more . . . it assures *100 and more* velvety-smooth shaves from *only one blade.* That's a fact . . . proven by men with all type beards. Just imagine one blade giving 6 to 12 months of shaving delight! Blade savings? Sure . . . but even more important . . . *a perfect shave every time.* It's the biggest shaving news since the safety razor, and you can prove it to yourself . . . without obligation!

PERFECT GIFT FOR ANY SHAVER!

Fine abrasive rollers *hollow-hone* edges . . . leather rollers *strop* them . . . *all in one operation* . . . for keener cutting, longest blade life ever. And even new blades can be sharpened to personal beard requirements with a Dremel. Speedy . . . only 15-20 seconds makes an average double-edge blade sharp as new . . . often better. Order yours today! (All-plastic housing 2½"x3¼"x3¼". Universal motor—110-120 Volt. AC-DC. Double-edge blades only.)

10 DAY TRIAL—MONEY BACK GUARANTEE. If dealer can't supply, order by mail. Try the Dremel Sharpener 10 days. If you don't get better, smoother, and more shaves than ever before, return Sharpener in good condition for prompt cash refund.

IF DEALER CAN'T SUPPLY—USE THIS ORDER

DREMEL MANUFACTURING CO. • DEPT. 121K • RACINE, WIS.

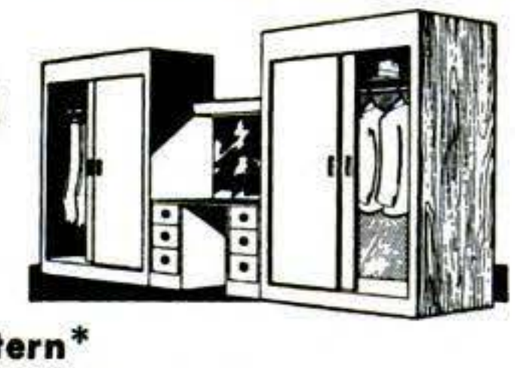
Enclosed is **$9.85.** Ship Dremel Sharpener postpaid.

Name.....

Address.....

City.....Zone....State.....

HAVE MORE CLOSET SPACE!



It's easy and money-saving with this NEW

Build-It-Yourself Pattern*

***and* Stanley Sliding Door Hardware**

You can easily double or triple your bedroom closet space . . . have convenient storage closets in the kitchen, living room, garage — and at a cost you can afford! Easi-Bild Pattern* now simplifies closet-making.

No special tools or skill required — pattern contains complete, easy-to-understand, step-by-step directions (written and illustrated), actual-size patterns, and complete list of materials.

Stanley Sliding Door Hardware is the key to this low-cost way of solving storage problems — gives you the most closet space in the smallest area. Simple directions make it easy to install hardware in minimum of time. See your hardware dealer for Stanley Residential Sliding Door Hardware and Easi-Bild Closet Wall Patterns #263. Or send 50c for your PATTERN TODAY.

**T. M. Reg. U. S. Pat. Off.*

Easi-Bild Pattern Co., Dept. S1
P. O. Box 215, Pleasantville, N. Y.

I enclose.....in coin, money order. Send me Wall Closet Pattern #263 and full details on Stanley Sliding Door Hardware.

Name.....

Address.....

City.....**State**.....

FIXES

Toys, Dishes, Books, Furniture

It's transparent, waterproof, flexible and durable. Get a tube today.

The Modern PLASTIC for lasting Home Repairs

PERMANENTLY mends cracks or holes in wood, tile, stone or plaster. Sticks and stays put—Does not chip, shrink or fall out. Easy to use. Economical. Mold it, chisel it, polish or paint it. If unobtainable from your lumber, paint or hardware dealer, the big 4-lb. can will be sent you postpaid (in U.S.) for only $1.15. Full money-back guarantee, order now.

DONALD DURHAM CO.
Box 804-V, Des Moines, Iowa

SPEEDI-GLU

PLASTIC GLUE FOR WOOD

***it's* NEW**
***it's* FASTER**
***it's* STRONGER**

- **EXTRA SPEED—Strong bond in just 30 minutes!**
- **EXTRA SAVINGS—Spreads 25% further!**
- **EXTRA EASE—No heating or blending, ready to use!**
- **EXTRA BEAUTY—Transparent when dry!**

This amazing plastic glue replaces old type glues. Ready for immediate use, allows ample assembly time. Use SPEEDI-GLU on woods, linoleum, fabrics, paper, ceramics, leather, porous pottery, felt, fibre, etc. Excellent for gluing Formica type plastics to wood.

SEND NOW . . . All orders postpaid. 4 oz. 59c . . . 16 oz. Giant size . . . $1.49 . . . 1 gallon Economy Size $6.00 . . . (Wholesale Quantities on Request.)

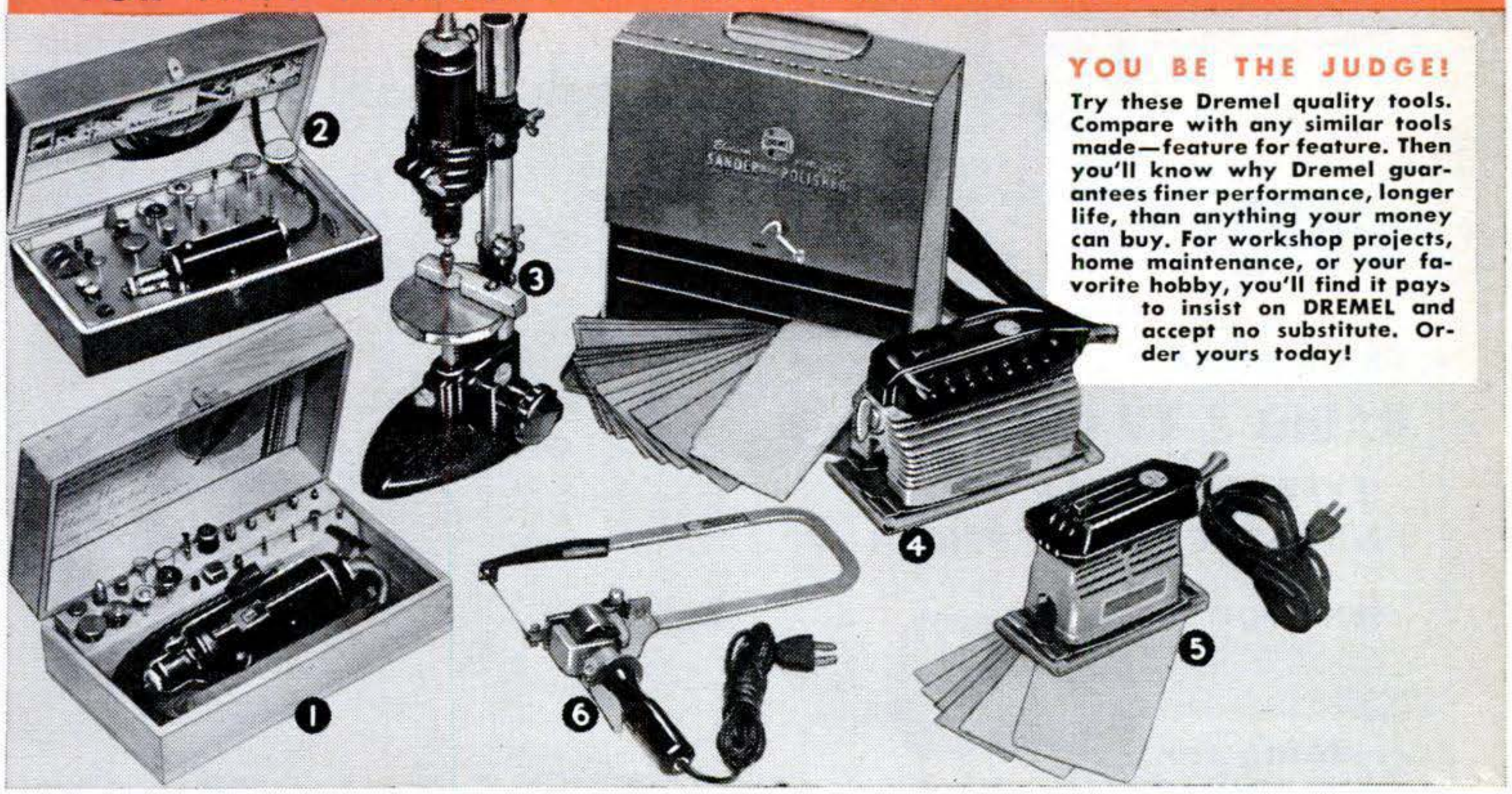
WHITE ADHESIVE CO., NEWTONVILLE 60, MASS.

Copyrighted material

HAVE FUN, SAVE MONEY with PRACTICAL QUALITY BUILT

DREMEL POWER TOOLS

FOR SHOP PROJECTS • HOME MAINTENANCE • HOBBIES



YOU BE THE JUDGE!

Try these Dremel quality tools. Compare with any similar tools made—feature for feature. Then you'll know why Dremel guarantees finer performance, longer life, than anything your money can buy. For workshop projects, home maintenance, or your favorite hobby, you'll find it pays to insist on DREMEL and accept no substitute. Order yours today!

1 MOTO-TOOL KIT No. 2—Dremel's Model 2 Moto-Tool is the *fastest, most powerful tool in its class*—delivers approximately 27,000 R.P.M. It grinds, carves, routs, drills, engraves, sharpens, etc.—works well in wood, plastics, metal. Saves plenty on home maintenance jobs. Performs hundreds of shop operations, and for hobbies it's a *must*. Precision made, shockproof, 110-120 V. A.C.-D.C. Motor, Moto-Tool No. 2 only, $16.50. Complete Kit with 23 high quality, shop-tested accessories (*High-Speed Steel* Cutters, Grinding Wheels, Polishers, etc.), *Only*..... **$23.50**

2 MOTO-TOOL KIT No. 1—Contains lighter capacity No. 1 Moto-Tool with 34 accessories (steel cutters, grinding wheels, etc.) in attractive, lacquer-finish wood case. *Biggest bargain in the field!* Tool alone with 1 emery wheel point is only $9.85. Complete kit, *Only*..... **$17.50**

3 PORTABLE DRILL PRESS—(Uses No. 2 Moto-Tool) Adds versatility to Moto-Tool operations. Ideal for model-making, wood carving, routing, etc. Precision built, 12" high. Price (less Moto-Tool) *Only*..... **$9.95**

4 MODEL 2000, SANDER-POLISHER—Fastest seller in the field. *Straight-line reciprocating action* guarantees *scratch-free finishes*. A fast-cutting production sander (14,400 sanding strokes per min.) for heavy-duty craft and wood-working projects, refinishing and redecorating. Gives you necessary power—*easy one-hand operation*—and 21 sq. in. of sanding surface for furniture making, boat building or refinishing, resurfacing large areas, building operations such as dry-wall joints, woodwork, siding and exteriors. Does a superb polishing job! Weighs 5 lbs.; needs no oiling; permits 10-second paper change; dustproof. Over-all size 3⅛" x 4½" x 7"; 110-120 V., 60 cycle A.C. With *steel carrying case*, 25 asst'd. abrasive sheets, sheepskin pad, *Only*..... **$24.50**

5 MODEL "A" SANDER-POLISHER-MASSAGER—A lighter-capacity machine with same construction features as larger model—including *straight-line action for scratch-free finishes* and 14,400 strokes per min. By far, the most popular sander ever offered home owners, house-wives, hobbyists for all their sanding, polishing, refinishing tasks. Also a soothing massager! Wt. 2½ lbs.; sanding pad 2¼" x 5½". Complete with asst'd. sandpapers, a felt and sheepskin polishing pad, *Only*.... **$14.85**

6 ELECTRIC COPING SAW—Safe as a handsaw—cuts scrolls like magic—sands as it saws! For home, hobby, repair work—no other tool pleases so much for so little cost. Works in any direction—smoothly delivers 7200 strokes per min. Saws through ¾" medium-hard wood at foot-a-minute speed. Trigger-touch foolproof action. Only 2 moving parts, never needs oiling, 110-120 V., A.C. *Free plans* packed with each saw for *6 useful wood projects*, and for *making your own table-type jig saw!* With 3 saw blades, *Only*..... **$5.85**

DREMEL *Electric* **TOOLS**
for SHOP and HOME

ELECTRIC DREMEL POWER TOOLS

SOLD BY BETTER DEALERS EVERYWHERE— If yours doesn't carry, remit in full for postpaid shipt. Or send only $2 now, pay postman balance plus postage and COD fee. *Five-day trial, money-back guarantee!*
DREMEL MFG. CO. Dept. 121-K Racine, Wis.

LARSON
The Foremost Name in
LEATHERCRAFT

GET STARTED RIGHT . . . MAKE FASTER PROGRESS

Easy-to-Assemble Kits for Beginners . . . Supplies and Tools for Experts

If you are a beginner, just becoming interested in the fascinating hobby of Leathercraft, get off to the very best start with LARSON Ready-Cut Kits of purses, belts, gloves, billfolds, woolskin animals, etc. No experience or tools needed . . . complete instructions for easy assembling included. SEND 10c TODAY for big, new illustrated catalog of ideas, kits, materials, supplies for both beginners and experts.

For more experienced leatherworkers, our stock of supplies, tools, top quality calfskins, and moderate priced tooling leathers is the most complete and varied in America.

J. C. LARSON COMPANY

820 SO. TRIPP AVE., DEPT. 717, CHICAGO 24, ILLINOIS

MAIL COUPON ➡

J. C. LARSON CO.
Dept. 717, 820 S. Tripp Ave., Chicago 24, Ill.
I am enclosing 10c. Please send me latest big illustrated Leathercraft catalog.

Name.....

Address.....

City.....State.....

Copyrighted material

FREE

★

1952 ALLIED RADIO & TV CATALOG

EVERYTHING IN RADIO AND TV AT LOWEST PRICES!

SEND FOR IT

212 PAGES Value-Packed

Everything for Experimenters, Builders, Amateurs, Servicemen, Engineers, Soundmen...

Save money on every Radio and TV need! Get the big 212-page 1952 ALLIED Catalog featuring the world's largest selections of top-quality electronic equipment at lowest, money-saving prices. See the latest in TV, home radios, Amateur equipment, P.A. systems and Hi-Fidelity custom sound, recorders, test instruments, builders' kits—plus thousands of parts, tools, books and diagrams. Get more for your money from the World's Largest Radio Supply House. Send today for your FREE 1952 ALLIED Catalog!

Save on Everything in Radio & TV

FREE CATALOG *SEND FOR IT TODAY*

ALLIED RADIO

ALLIED RADIO CORP., Dept. 7-K-1
833 W. Jackson Blvd., Chicago 7, Ill.

☐ Rush FREE 1952 ALLIED 212-Page Catalog

Name _____

Address _____

City _____ *Zone* ____ *State* _____

BUILD YOUR OWN POWER TOOLS - TILT/ARBOR SAW, BANDSAW, BELT SANDER

SAVE $50. OR MORE

Exclusive GIL-BILT Build-It-Yourself Features

- No machining—build easily with hand tools only
- No blueprint reading—step-by-step pictorial plans, full scale patterns, actual photographs
- Sturdy wood, aluminum, and steel construction
- Capacity and performance of commercial saws selling for $60 and up

GIL-BILT 10-INCH TILTING ARBOR SAW

- 27x28 in. table, 13½ in. capacity in front of blade
- 10 in. blade cuts 3¼ in. deep, tilts full 45 degrees
- Floor model 34" high, table always stays level
- New Departure ball bearing arbor, ¾" precision shaft turned down for ⅝" bore blades, alum. housing, shipped ready to run
- Jackscrew and 4½ in. dia. handwheel lowers and raises blade
- Cast aluminum miter gauge and self-aligning rip fence guide

GIL-BILT Metal Parts Kit includes Plans, ball bearing arbor, miter gauge and bar, rip fence guide, dado insert, lock knobs, jack screw mechanism and handwheel, and all other metal parts (less blade) **$20.95**
Same Kit with 10" Combination Blade **$24.90**
Same Kit with 8" Combination Blade **$23.90**

GIL-BILT 12-INCH BAND SAW

- Cuts to center of 24 inch circle
- Handles stock up to 6 inch thick
- 18x18 inch table tilts 45 degrees
- Lower wheel and drive pulley runs on sealed New Departure Ball Bearings; Upper wheel runs on two ⅝" bore Oilite Bronze bearings
- Upper wheel tension and tilt mechanism of cast aluminum, completely assembled
- Upper and lower blade guides. Each has ball thrust bearing, self-lub bronze jaws
- Rigid cast aluminum wheels fully machined ready-to-install. Heavy rubber tires
- Uses standard 78 inch blades up to ⅜ in. wide
- Fully enclosed mechanism for utmost safety

GIL-BILT Metal Parts Kit includes Plans, rubber tires, aluminum wheels, ¼ in. blade, ball bearing spindle, tilt mechanism, blade guides, table tilt segments, and all other metal parts **$20.95**

Return Kits in 10 days for refund if not satisfied.
(Prices include postage within 600 miles. Over 600 add 5%)

Also available—Plans and Parts Kit for Belt Sander and 8" Tilt/Table Saw. Order Plans at $1.00 each—Send postpaid anywhere in the world or write for FREE descriptive catalog.

GILLIOM POWER TOOLS P. O. Box 1-VK, Lambert Field St. Louis 21, Missouri

SAW SHARPENER

Table model, gums and sharpens rip saws, combination saws & cut-off saws. Ideal for "Skilsaw" blades. Cap. 4" to 20" diam. Complete with ¼ h.p. motor & 1 grinding wheel & cord—$64 f.o.b. Portland. Shipping weight, 63#. SEND FOR FREE LITERATURE.

P. T. HOBBS MACHINERY
8375 N. Interstate, PS-101, Portland 17, Ore.

POWERFUL MAGNET 1.95 P. P.

New type HIGH POWER permanent magnet (Alnico) will never weaken in normal use. LIFTS 25 pound steel block! (Weighs ¾ lb.) No electricity needed. RETRIEVES tools, tackle, etc. from under water or other inaccessible places. REMOVES harmful nails, wire, etc. from alleys, driveways or livestock paths. MANY other uses listed. Quickly PAYS for itself. Try magnet AT OUR RISK; money refunded if not 100% pleased. . . . $3 magnet NOW $1.95 (No C.O.D.) Only 900 left. Larger sizes also available.

RONALD EYRICH, 1219 W. Meinecke Ave., Milwaukee 6, Wis.

"WOVEN-Gards"

BETTER Hand Protection at Amazing Low Cost

"Woven-Gards" are hand protectors, mitts, pads and sleeves made of a new long-wearing safety material. They provide flexibility, comfort, resistance to abrasion and cutting far beyond that of anything used before. They are extremely oil-absorbent and do an excellent job when handling oily, slippery sheets. The porous weave makes them one of the finest protectors for handling lower temperatures. Enthusiastic users say they have never seen values like "Woven-Gards." Excellent protection at lowest cost. Send now for descriptive folder and prices.

INDUSTRIAL GLOVES CO.
1940 Garfield St., Danville, Ill.
(In Canada: Safety Supply Co., Toronto)

Copyrighted material

Transveneer PLASTIC FILM VENEER

Makes any Smooth Surface look like beautiful . . .

WOODS • MARBLES • LEATHER

TRANSVENEER brings you authentic reproductions of beautiful Mahogany, Walnut, Oak, Blonde Prima Vera, Marble and Leather. Comes in *film-like sheets* you yourself can quickly apply to wood, composition board, glass, metal, plastic, or *any smooth surface!*

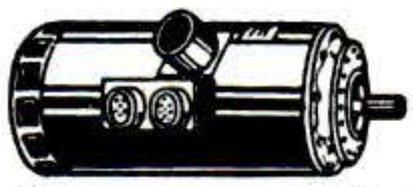
IDEAL FINISH FOR FURNITURE—makes inexpensive pieces look like rare and costly wood! EASY TO APPLY, durable, washable, heat-resistant. Application materials and directions come in handy Kit. Buy at Dept., Paint, Hdwe. and Building Supply stores.

FREE! *Write for free sample and pattern folder.*

TRANSVENEER Division of The DI-NOC Co.
1005-C Public Sq. Bldg. • Cleveland 13, Ohio

BUY U. S. SAVINGS BONDS

WAR SURPLUS BARGAINS



GENERATORS 115V-AC

FOR AUXILIARY LIGHT PLANTS

NOW . . . here's the buy of the year. Brand new Eclipse Generators in the original box These generators have an AC output of 115 volts, 10.4 amps, 1200 watts, single phase, 800 cycles at 2400 R.P.M. They also have a DC output of 28.6 volts, 60 amps. The unit has a spline drive shaft and is self excited. It will serve as a dependable 115 V.-AC auxiliary light plant when driven by a gasoline engine for farms, cottages, flood lighting, trailers, boats, or wherever power is not readily accessible. Shipping wt. 55 lbs. Govt. cost more than 10 times selling price. *F.O.B. Pasadena*

ONLY **$29.95**

BRAND NEW POLE CLIMBERS

Buckingham pole climbers in their original package. (Without Straps) ONLY **$2.95** PER PAIR

LINEMAN'S TOOL & SAFETY BELT

Brand new web-type belts in their original box. SPECIAL **$3.95**

STRAPS & PADS . . . for climbers Used, **$1.50** SET

All Equipment F.O.B. Pasadena • Enclose Full Amount with Order

C and H Sales Company
BOX 356-F EAST PASADENA STATION • PASADENA 8, CALIFORNIA

$34.50

Makes dull, tiresome jobs fun. With this professional, motor-driven, orbital-motion SpeedSander, you can quickly and easily re-surface and refinish furniture, woodwork, walls or metal . . . can sand-off old paint, stain, enamel, rust or corrosion; smooth rough plaster; or buff, burnish or rub to a "piano finish." Operates with wet or dry abrasives. Three 4½"x6½" covers cut from 9"x11" sandpaper or abrasive sheet. Your local dealer will gladly demonstrate.

No. 150K SpeedWay SpeedSander Kit

Everything you need in fitted steel carrying case—18 each of 5 grades of sheet abrasive, 2 free abrasive felts, thick neoprene contour pad, steel surfacing plate, lambs wool polisher and cover template.

$49.50

SpeedWay Speed Drills

Far advanced in design and construction these new SpeedDrills are lighter, handier, yet more powerful and faster-drilling than more costly old type drills. Drill steel, wood or concrete. Quality built for lifetime service, of die-cast aluminum with cast-in air cooling system and self-lubrication. Heavy cut-steel gears. Ball thrust bearings. Your SpeedWay Dealer will point out the many other superior features.

SpeedWay Kits Make Ideal Gifts

Any craftsman or "Mr. Fix-it" will be thrilled with a SpeedDrill Kit that drills, grinds, sands, buffs, polishes. No. 79 Kit provides a No. 79 ⅜" capacity (in steel) SpeedDrill, a SpeedStand, wire brush, sanding discs and backer plate, cloth and lambs wool polishers, paint stirrer and 5 steel drills—31 pieces in all in fitted steel carrying case, complete **$32.50**

No. 200 Kit. (Not illustrated) Similar to No. 79 Kit but with No. 200 ¼" capacity (in steel) SpeedDrill and 28 accessories in fitted case, complete **22.50**

GA Kit. 20,000 r.p.m. SpeedWay No. 129 Hand Grinder with 16 mounted cutters, brushes, and wheels, complete in leatherette case. **$14.50**

Bench SpeedGrinders—**$16.50** to **$32.50**—Ask your dealer to show them to you.

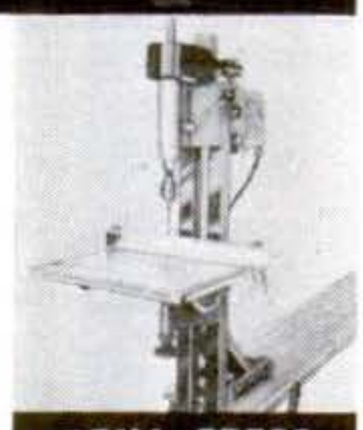
SpeedWay MANUFACTURING CO.
1864 SO. 52nd AVE., CICERO 50, ILL.

Copyrighted material

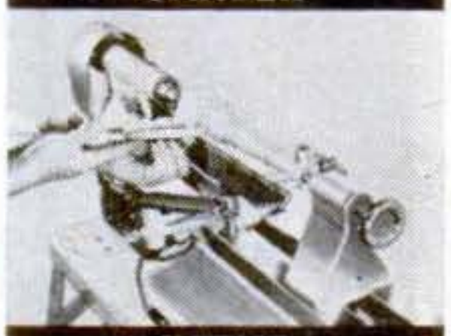
Compare

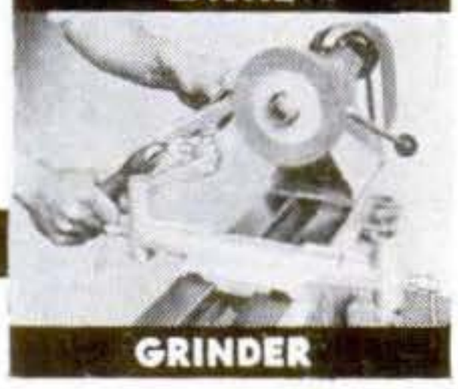
SUPERSHOP

FEATURE for FEATURE
DOLLAR for DOLLAR


DRILL PRESS

SANDER


LATHE


GRINDER

Buy SUPERSHOP direct from factory and save. Lifetime lubricated ball bearings. Precision-built. RUGGED. Handles BIG jobs. Complete line of accessories available. 15 day FREE trial. Money back guarantee. Mail postcard for FREE CATALOG.

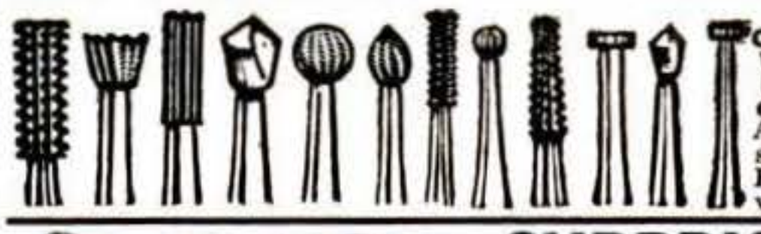
RETAIL PRICE $125.00
FACTORY TO YOU
$79.95

POWER TOOLS INC.
228 YATES AVENUE
BELOIT, WISCONSIN

AMAZING TOOL BARGAINS!

ALL BRAND NEW MERCHANDISE

12 MINIATURE CUTTERS $1.00



For Cutting Wood, Plastic, or Metal. Post-paid in U.S.A. Actual size. Asst. shapes on 3/32" shank. For die makers, home workshop, etc.

SURPRISE VALUE

100 Pieces $1.00
FOR ELECTRIC GRINDERS
Post Paid in U.S.A.

Grinding Wheels, Cut-off Wheels, Sanding Discs, Mounted Stones, Sharpening and Honing Stones, Rotary Cutting Burs, Abrasive Cartridges, Mandrels, and many other items.

12 MOUNTED WHEELS

and points on 1/8" Mandrel. For grinding on plastic, wood, soft and hard metals. Regular $8.40 List Val. ONLY **$2.95**
12 WHEELS ON 1/4" MANDREL **$3.60**

FLEXIBLE SHAFT—ONLY $4.95 P.P.

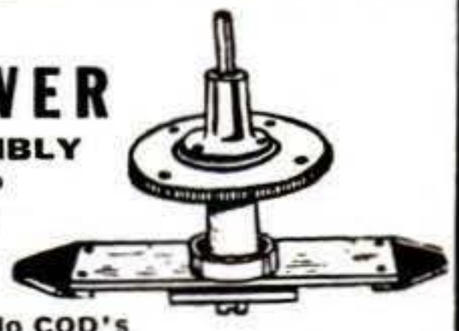
Light, economical, durable. For workshop or home. 35¾" long. Oilite bearings. Core of specially wound, high carbon steel wire in flexible steel casing. Will accommodate tool shafts up to 1/8" diameter. For lathes, electric drills, etc.

SCHUPACK SUPPLY CO., 7331 Cottage Grove, Dept. S-101, Chicago 19, Ill.
(Illustrated Bargain Catalog Free)

Make Your Own

POWER LAWN MOWER

with this DRIVE CUTTER ASSEMBLY



Constructed for those who desire to build their own mower or to replace your old cutter assembly. Complete with 18" blade and double ball bearing drive, only **$12.95**
Add 50c to cover handling & shipping. No COD's

Special: COMPLETE POWER MOWER

Just add electric motor or gas engine, 18" cut, FOB. KC. Write for descriptive catalogue. **$44.95**

ATLAS EQUIPMENT Co., Dept. PS-10
229 SW BLVD. KANSAS CITY, MO.

SHEET METAL BRAKES

Forms angles, flanges and Pittsburgh locks. 26 gauge steel, heavier aluminum. Cam locking. Portable, can be bolted to bench, or clamped to edge of truck. All steel, reinforced. Shipped Exp. Coll. 30" size. Wt. 54 lbs., **$26.50.** 36", Wt. 66 lbs. **$31.00.** 48", Wt. 100 lbs., **$45.00.** Floor mountings, portable, 32" high, 30 lbs., **$7.00.** 12" **BRAKE.** Fits in vise to form difficult compound bends, up to 20 gauge steel. Not illustrated . . . . . **$12.50 P.P.**
5" Wide Pliers forms locks **$2.50**
24" CURVE FORMER, 2 roll, 16 gauge, 2" to 2' dia. . . **$10.00 P.P.**
IRON BENDER. 1/4x2" capacity, 10 parts. All steel . . . . **$10.00 P.P.**

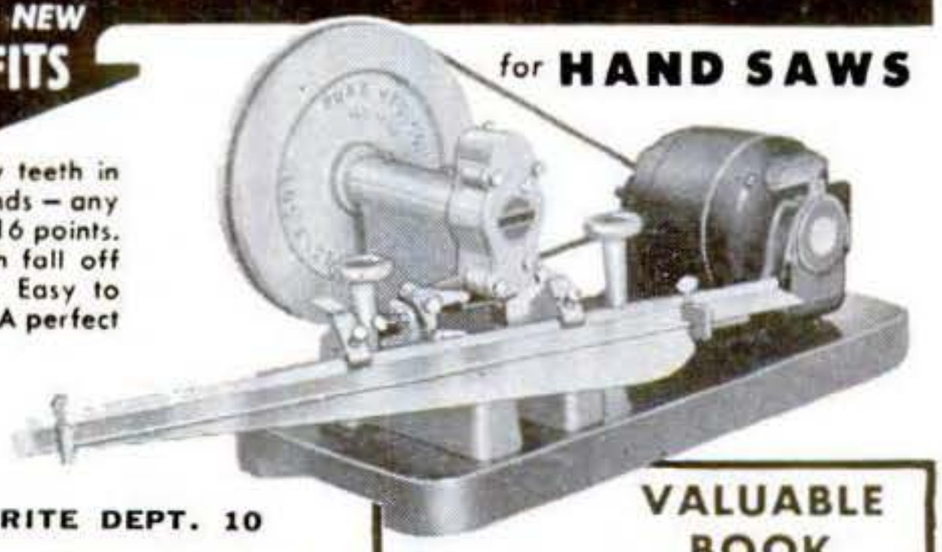
30"—36"—48"

Immediate delivery. Order direct, cash or C.O.D. or send for folder.
VYKE BRAKE CO., S-1116 So. 27th St., Omaha 5, Nebr.

AUTOMATIC RETOOTHER

MAKES NEW **PROFITS**

for **HAND SAWS**



Cuts new teeth in 50 seconds — any size 4 to 16 points. Old teeth fall off as chips. Easy to operate. A perfect job.

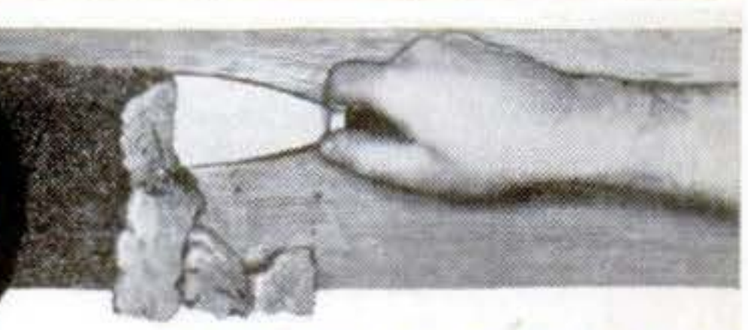
WRITE DEPT. 10

BURR MFG. CO.
8943 VENICE BLVD.
LOS ANGELES 34, CALIFORNIA

VALUABLE BOOK
25¢
Order Burr's Blue Book of Coast to Coast prices for saw shop services

---

PAINT COMES OFF



. . . QUICKLY-EASILY!

Don't waste time and effort with old-fashioned methods of removing paint. Do it the fast, modern WONDER-PASTE way.

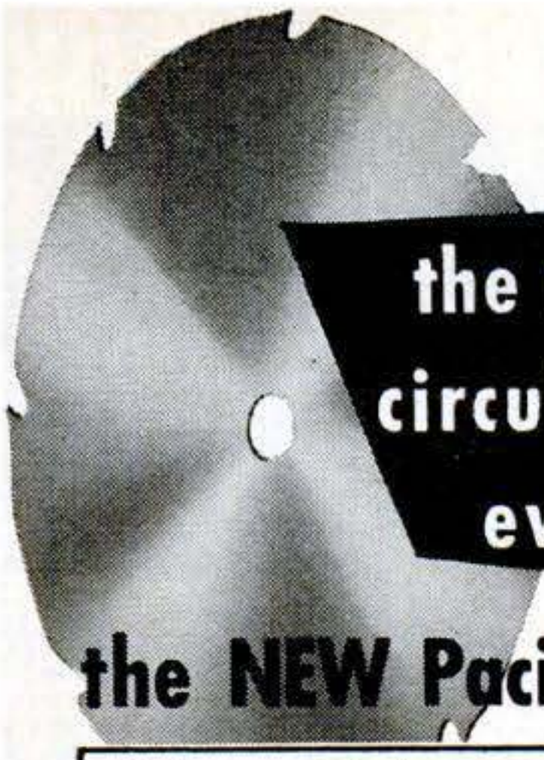
Wonder-Paste is a deep-cutting solvent applied with a paint brush. It softens up tough, thickly coated paint, varnish, enamel, lacquer, shellac, etc. and forms a soft sludge that comes off clean. Does not run on upright surfaces. Use it indoors or outdoors. Harmless to hands or fabrics.

Get Wonder-Paste — at paint and hardware stores.

Wilson-Imperial Company, 121 Chestnut Street, Newark 5, N. J.

Write for WONDER-PASTE leaflet

Copyrighted material



the most amazing circular saw blade ever developed!

the NEW Pacific Safti-Cut!

11 improved features...gives truer, smoother cuts ready for edge-gluing without additional finishing.

Using a wedge-like cutting action similar to that of a plane or jointer, the new Pacific Safti-Cut gives cuts so smooth they're ready for gluing without additional finishing! "Kick back" and serious injuries are almost eliminated because the cutting teeth (only 8 or 12) project on 20/1000" above the non-cutting edge. This makes it practically impossible for the blade to pick up the wood and hurl it back at the operator.
OTHER IMPORTANT ADVANTAGES...fewer teeth make resharpening easy...reduces noise and blade stalling ...operates on 30% less power...teeth stay sharper longer because they're made from nickel chrome steel.

Order your Safti-Cut NOW!

Dia.	8 tooth	12 tooth
6"	$3.60	
7"	4.25	$4.25
8"	4.89	4.89
10"	6.09	6.09

Specify arbor hole dia.

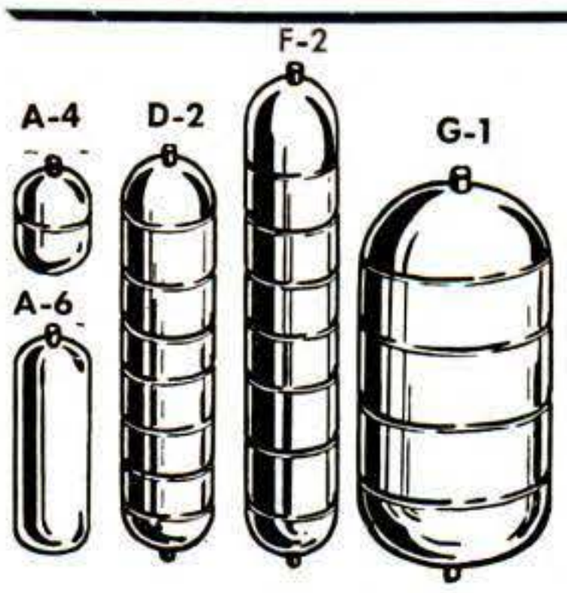
Send check or money order to: WESTERN SAW MFR., INC., 1840 B West Washington Blvd., Los Angeles 7

Agents and dealers wanted

ALNICO

MAGNETS LIFT 175-lb.

AMAZING PERMANENT MAGNETS—WILL NOT WEAKEN! NON-ELECTRIC. Retrieve guns, tackle, tools and other steel items from lake, river, plating tanks, drains or other hard-to-reach spots. Recover drills, taps, etc. from floor sweepings. Clear alley of harmful tacks, nails. Many other uses listed. Pays for itself quickly. GUARANTEED: Try any magnet one week. Money refunded if you are not well-pleased.
Cat. No. 675 (Has a pull of 175 lbs. on a flat steel block) $10.50
Cat. No. 650 (150 lb. pull) **$8.50.** Cat. No. 550 (50 lb. pull) $ 4.00
Cat. No. 530 (30 lb. pull) **$3.00.**
Cat. No. 30—Hobbyist assortment of six medium magnets..$ 1.50
Send M. O. or check. We pay postage.
MIAMI MAGNET CO.
3240 N.W. 27th Ave., Aviation Bldg. No. 43, Miami, Florida



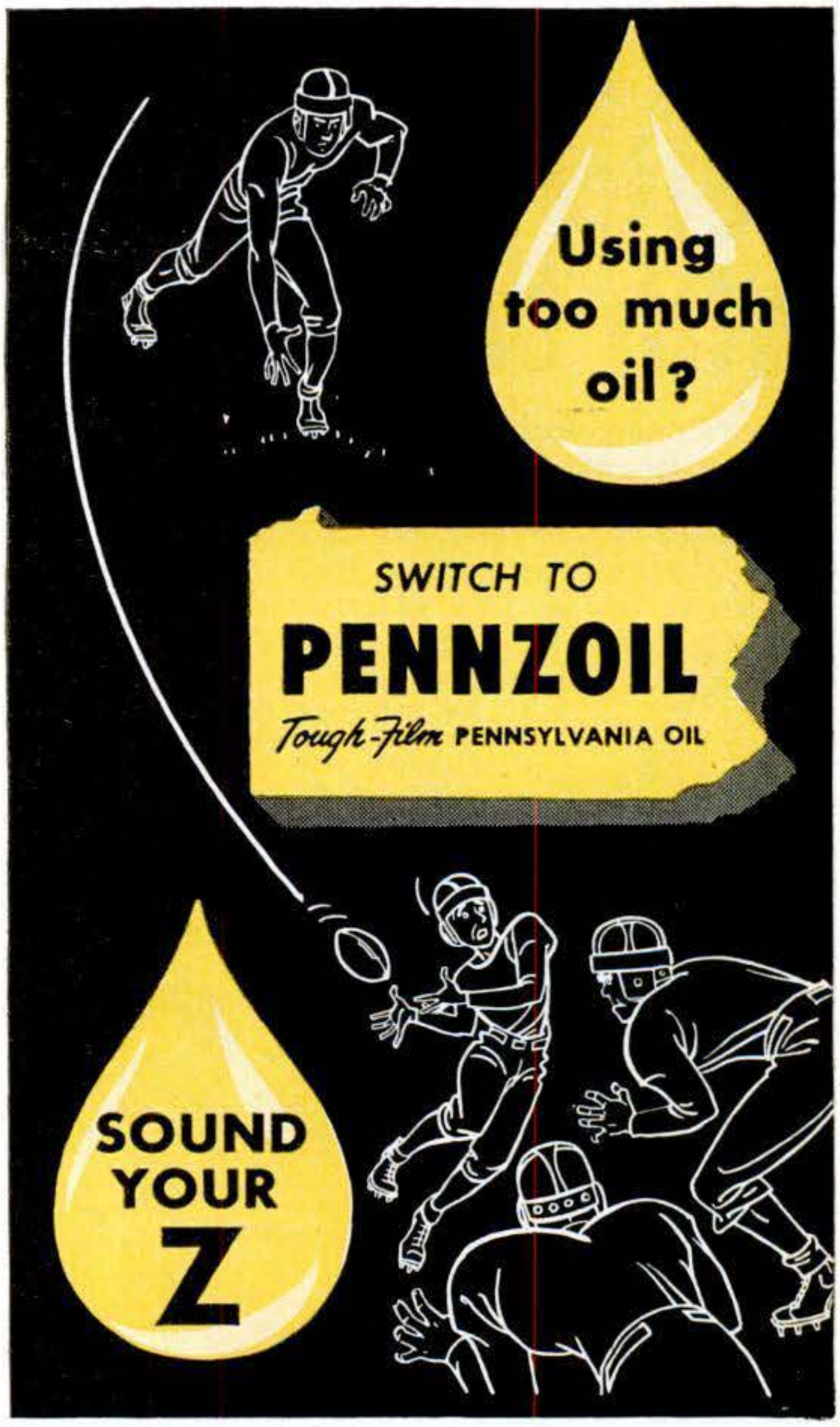
STEEL AIR TANKS

Steel pressure tanks suitable for compressors, pneumatic units, gases, hydraulics, and liquids. Rated at 500 lbs. per square inch pressure. ¼" standard pipe thread openings on tank ends as shown.

		Size	Wt. Lbs.	Internal Volume	Price
A-4	Stainless Steel —New	7½" x 5¼"	1½	104 cu. in.	$1.50
A-6	Carbon Steel —New	14½" x 5½"	3¼	280 cu. in.	3.50
D-2	Stainless Steel —New	24" x 6"	5	500 cu. in.	5.50
D-2A	Carbon Steel —New	24" x 6"	5	500 cu. in.	4.50
F-2	Stainless Steel —New	45" x 6"	11	1000 cu. in.	9.50
F-2A	Carbon Steel —New	45" x 6"	11	1000 cu. in.	5.50
G-1	Stainless Steel —New	24" x 12"	18	2100 cu. in.	11.50
G-1A	Stainless Steel —Used	24" x 12"	18	2100 cu. in.	9.50

Prices F.O.B. Chicago. Include approx. postage on orders paid for in advance. C.O.D. orders enclose 25%, balance sent C.O.D.

U. A. S. Corp. Dept. PS-10 5637 W. 63rd Pl. Chicago, Ill.



When you demand the best motor oil for your car, you're entitled to Pennzoil Quality...

INSIST ON PENNZOIL!

SOUND YOUR Z
100% Pure Pennsylvania
PENNZOIL
Safe Lubrication

PENNZOIL MOTOR OIL AND LUBRICANTS

AT BETTER DEALERS . . . COAST TO COAST

Member Penn. Grade Crude Oil Assn., Permit No. 2

Copyrighted material

You'll do better work with better tools

There's one point on which all mechanics agree—better tools mean better work. That's why you'll see these Stanley Tools in the tool chests of skilled woodworkers everywhere. Accuracy and easy driving action make these tools perfect partners for better boring. Buy where you see the famous Stanley trade mark. It's your assurance of better tools.

No. 610 Hand Drill. New! Enclosed gears for safety. Drills holes easier and faster to full ¼" capacity.

No. 59 Doweling Jig For boring holes accurately and easily in the edge, end or surface of boards. Furnished with depth gauge and six guides — 3/16, ¼, 5/16, 3/8, 7/16, ½".

No. 923 Bit Brace. New self-centering chuck. Forged Universal jaws hold straight shank bits and drills from ⅛" to ½", all sizes auger bits.

NEW Series C
Early American Designs
Set of 15 plans 25¢
Fun to make — easy to follow.
Tear off this coupon and mail.

Jewel Box
Smoker's Wall Rack
Bed Side Stand
Miniature Dresser Chest
Miniature Hutch Table
Corner Shelves
Miniature Cobbler's Bench
Spoon Rack
Dutch Corner Shelves
Colonial Foot Stool
(Five other selected projects)

Stanley Tools
New Britain, Conn.

The Tool Box of The World

STANLEY
Reg. U.S. Pat. Off.

HARDWARE • TOOLS
ELECTRIC TOOLS
STEEL STRAPPING • STEEL

SEND ME SERIES C

Stanley Tools, 4101 Elm St., New Britain, Conn.
(In Canada: Stanley Tool Co. of Canada, Ltd., 4101 Stanley St., Roxton Pond, Quebec).

I want ( ) Series C Early American Designs.
Enclosed is 25c for each set.

Name.....

Street.....

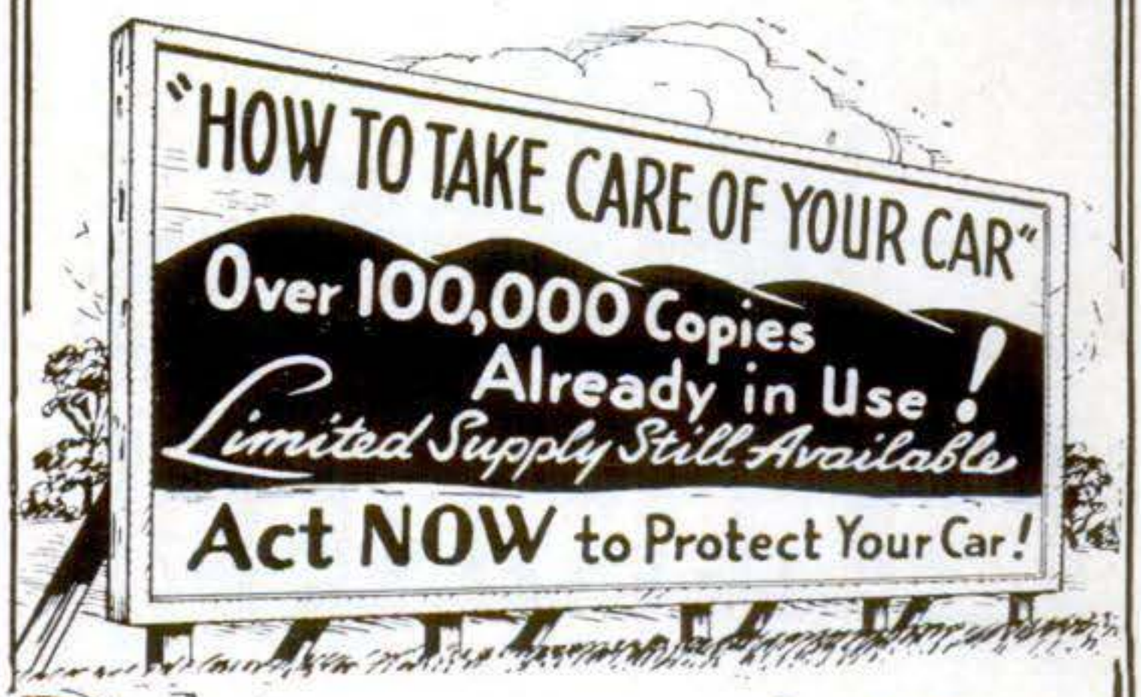
City.....**State**.....

BIG NEW AUTO BOOK Shows You How To CUT Repair and Service Costs to RECORD LOW!

Popular Science Experts Help You Put and Keep Your Car in Order!

Now *you* can do something about today's high cost of car care and repair—*"How to Take Care of Your Car"* shows how *you* can easily solve hundreds of car problems yourself!

Big book is jammed with non-technical instructions, pictures showing you, a non-professional, how to: Save on Gas, Oil, Tires; Locate, Repair Car Troubles on Road, at Home; and *much more!*



Only $1.98
DELUXE $2.48

256 BIG PAGES!
750 PICTURES!
851 NEW IDEAS!

SEND NO MONEY! All you do is merely detach Coupon below and mail in now. Enjoy week's FREE trial! Balance of edition going fast; we may never again be able to offer book at low bargain price of $1.98! Paste Coupon to penny postcard—mail *TODAY!*

POPULAR SCIENCE, DEPT. 1051
353 Fourth Ave., N. Y. 10, N. Y.

Please send "HOW TO TAKE CARE OF YOUR CAR" in edition checked below. I will pay postman price plus postal fees. If not satisfied, I may return book within 7 days for refund of purchase price.

☐ Regular Cloth-bound Edition: **$1.98**
☐ De Luxe Edition, bound in lifetime Buckram; title stamped in gold. **Only 2.48.**

Name.....
Address.....
City.....Zone.....State.....

☐ Check here if you remit now. We will pay all shipping costs. Same return privilege.

Copyrighted material

EVERY ¼" ELECTRIC DRILL A PORTABLE SAW IN ONE MINUTE!

"ARCO-SAW" (Over 100,000 Sold)

At Better Hardware Stores Everywhere

Pat. Pend.

No. 444 "ARCO-SAW" **9.95** with 4" "HYCARBON" Crosscut Blade

CAN BE USED WITH ONE HAND!

"ARCO-SAW" works like a high priced Portable Saw. RIGHT ANGLE GEAR DRIVE eliminates clumsy, dangerous direct drive with drill sideways.

CUTS 1-5/16" or 2x4 by turning over

FEATURES: **Safety-yoke** assures rigid connection and **absolute safety. Visual guide and wide shoe-plate** for straight, square cuts. **Big handle** affords firm grip for two hand operation. **Precision one-piece** gear box. **Self-lubricatin** life-time bearings.

'ARCO SAW'

NEW! No. 445 "ARCO-SAW" for DEPTH & BEVEL CUTS

No. 445 "ARCO-SAW" **11.50** with all Gages and 4" "Hycarbon" Crosscut Blade.

(Also Available: No. 444G DEPTH-BEVEL-RIP GAGE. Easily attaches to any No. 444 "ARCO-SAW" . . . $1.95)

HAS ALL FEATURES LISTED ABOVE PLUS:

Depth gage graduated from 0 to 1¼" depth (for grooves, dados). **Bevel gage** graduated from 0 to 45° angle (for dovetails, bevels). **Rip gage** with sideways adjustment. **Visual guide** with adjustment to follow lines on both straight and bevel cutting.

"HYCARBON" REPLACEMENT BLADES,

4" Crosscut or 4" Combination . . . **$2.00**

90-DAY FACTORY GUARANTEE

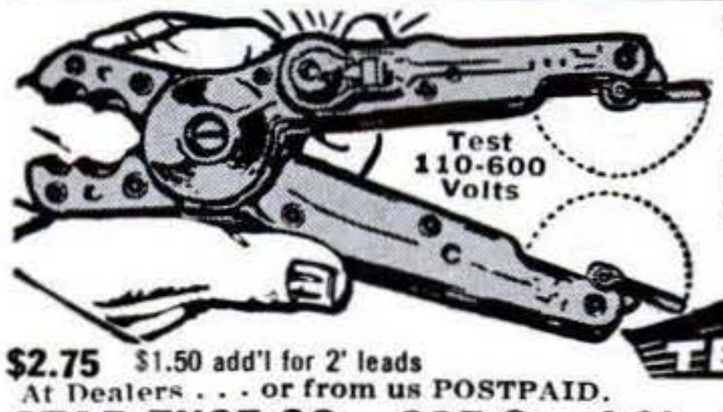
ORDER TODAY at your dealer or send us check or M. O. (Postpaid). C.O.D.'s—postage extra. Ask for literature of other tools.

UNCONDITIONAL 10-DAY MONEY BACK GUARANTEE

DEALERS—Write for nearest jobber.

ARROW METAL PRODUCTS CO.

DEPT. PS-10, 140 WEST BROADWAY, NEW YORK 13, N. Y.



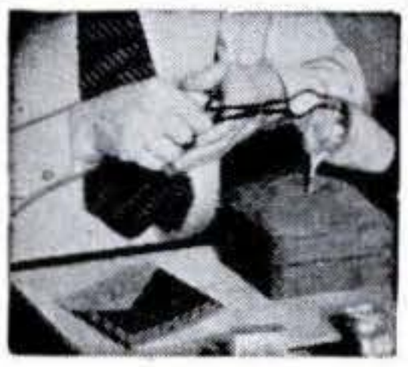
TEST Circuits, Fuses, Outlets *easily, quickly, safely.* Shockproof. Pull fuses 10 to 100 Amp.

STAR* TEST-PLIERS

$2.75 $1.50 add'l for 2' leads

At Dealers . . . or from us POSTPAID.

STAR FUSE CO., 237 Canal St., New York 13, N. Y.



BRONZE FOUNDRY

Schools and Home Workshops

Make your own castings of aluminum, copper, bronze, silver. Foundry sets are available in three sizes including 2400 Deg. F. blast Furnaces, $22.50; $29.50; and $42.00, f.o.b. Kansas City. Free Circular.

KANSAS CITY SPECIALTIES CO. P. O. BOX 6022, DEPT. S-10 KANSAS CITY, MO.

WELD BRAZE, SOLDER, and CUT →

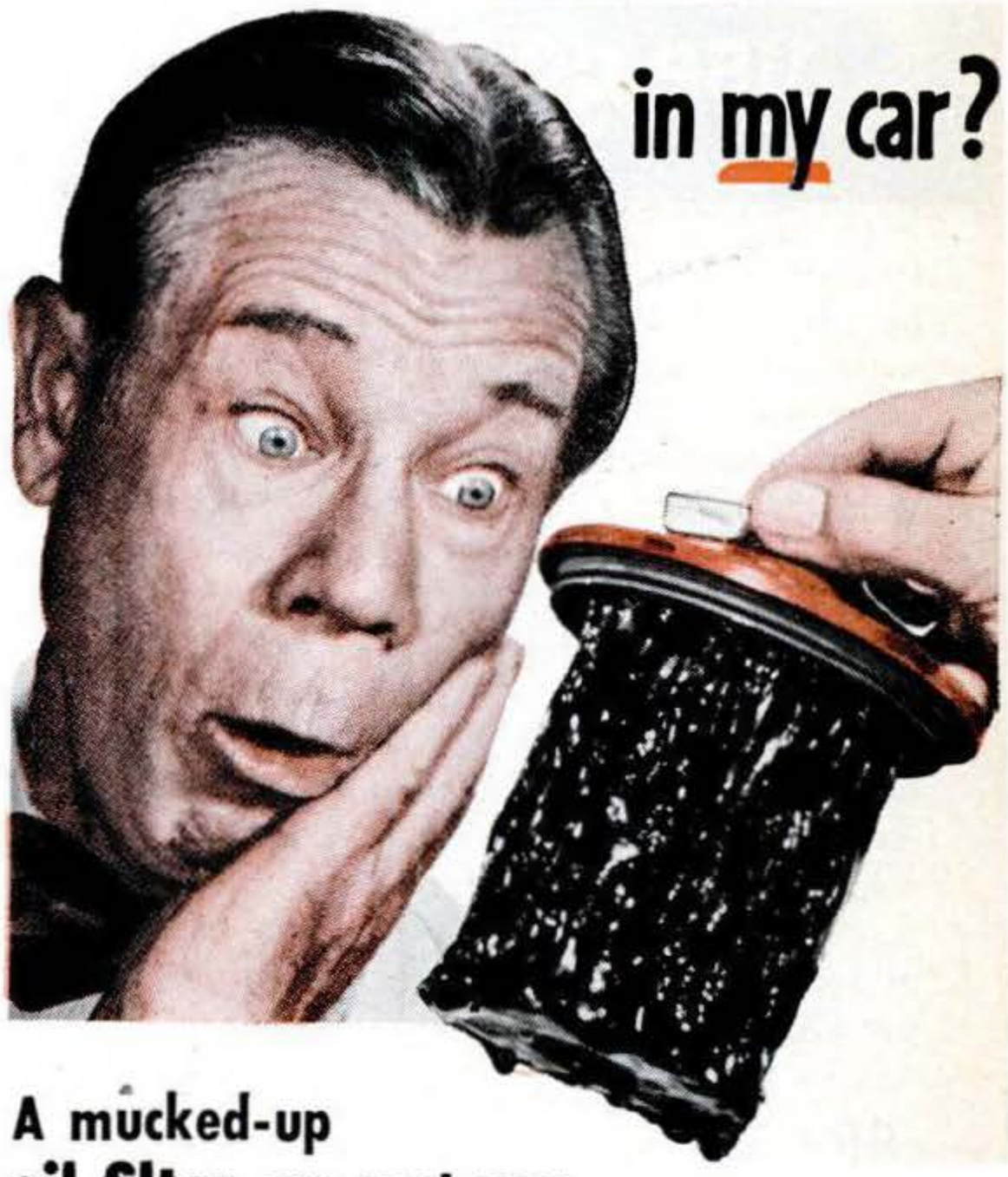
ONLY $14.75 F.O.B. complete!

No experience needed. Follow simple instructions, weld on iron, steel, bronze, brass, aluminum, and other metals. Plugs into any properly wired 110 volt A.C. or D.C. line. **Make or save time and money doing repair work for yourself and others. Repair men, farmers, tinsmiths, home and auto owners, hobbyists, etc., say FOUR-WAY pays for itself over and over.** Order today or send for Free details.

ORDER NOW 10 DAY TRIAL

FOUR-WAY WELDER COMPANY, Dept. F3-KB
2326 So. Michigan Ave. • Chicago 16, Illinois

WHAT... that muck in my car?



A mucked-up oil filter can cost you plenty in engine repairs. Get in a new Purolator* Refill—quick!

Hard to believe—but true! A filter may collect over 2 pounds of engine-wrecking muck out of your motor's oil stream. It gets clogged in time—can't keep up its motor-saving . . . dollar-saving work.

What to do? Don't delay—get in a clean filter refill—fast. **Which make?** Pays to buy the best—a Purolator Micronic*. New accordion-type design gives up to 10 times the filtering area—with pores so tiny they trap particles you can't even see. **Cost much?** Strictly small change—$1.38 to $3.00 depending on car make. Purolator Products, Inc., Rahway, N. J.; Toronto, Ontario, Canada.

*Reg. U.S. Pat. Off.

PurOlator

MICRONIC

OIL FILTER

Right you are—it's **JOE E. BROWN** co-starred in **"SHOW BOAT,"** an M-G-M Picture. Color by Technicolor.

Copyrighted material

Why do piston rings wear out if you use good oil?

If your piston rings were always protected by oil, they'd last longer. Unfortunately, when you start your car after long stops, it takes up to five minutes for oil to reach all vital parts. Meanwhile, dry metal grinds against dry metal. This DRY STARTING forms "Metal Ulcers" . . . causes most engine wear.

To stop it, use Miracle Power in your gas and oil. The colloidal synthetic graphite in Miracle Power clings to rings and cylinder walls . . . lubricates them until oil arrives. Actual tests show 49% less piston ring wear. Result—longer engine life . . . more power . . . more miles per gallon because of freer movement of parts. Next time you get gas, get Miracle Power.

Miracle Power Division

THE AP PARTS CORPORATION • TOLEDO, OHIO

Manufacturers of: AP *Mileage Getting* Mufflers and Other AP Quality Products

Miracle Power

in gas and oil every 1000 miles—75c per can

Send for literature explaining how to make your car last longer. FREE

THE AP PARTS CORPORATION
1072 AP Building, Toledo 1, Ohio

☐ Please send me FREE literature on making my car last longer.

☐ I want to prove the benefits of Miracle Power myself. Enclosed is check or money order for $1.50. Please send me 2 trial containers of Miracle Power *postpaid*.

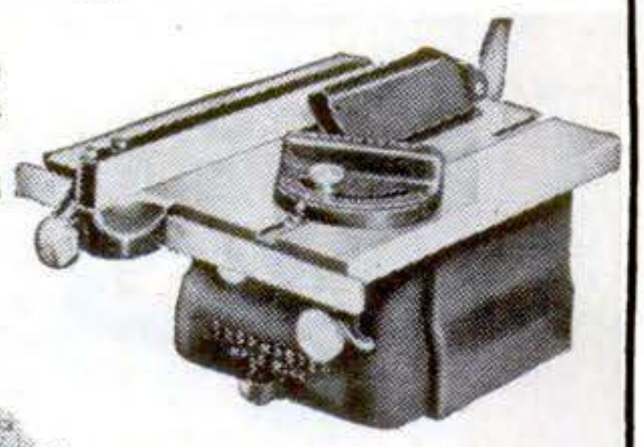
NAME_____

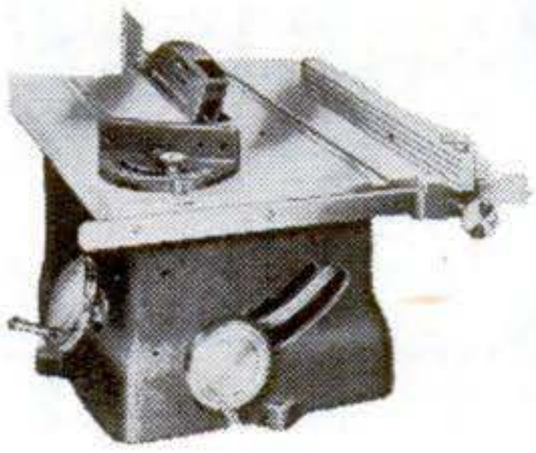
ADDRESS_____

CITY_____ ZONE____ STATE_____

A SHOPMASTER Circle Saw ...for any Purpose or Price

A Shopmaster Circle Saw is known for its ruggedness and precision.
7" Tilting Arbor Saw **$47.95**





Satisfaction guaranteed.
8" Tilting Table Saw **$51.51**
7" Tilting Table Saw **$33.95**
All Prices Zone 2, slightly lower in Zone 1

Large working surfaces on all Shopmaster Saws.
8" Tilting Arbor Saw **$76.95**
10" Tilting Arbor Saw **$86.95**
10" Floor Model... **$105.00**

Write today for catalog of *COMPLETE* line

SHOPMASTER, INC.

1214 Third Street South • Minneapolis 15, Minnesota

ELECTRIC SHEAR SHARPENER

Over 75,000 Sold—It Must Be Good!

Genuine Carborundum wheel ideal for shop or home use. Send remittance with order and shipment will be made at once, prepaid to your door, complete with electrical goods catalogue.

Motor driven **$9.75** complete with vise

WILLIAM MARVY COMPANY, Dept. 12
479 St. Peter Street St. Paul 2, Minn.

$ FREE COURSE! BIG PROFITS! $

Flocks & Sandblasts

Dual Purpose Spray Gun! Uses only 25 lbs. Air Pressure!

• Thousands of uses in Home, Shop, Industry: Makes Auto Interiors Clean & New, Lines drawers, Marproofs lamp bases, Refinishes any object. All in colorful Flock. Etch & Frost windows, glassware, etc. Removes Paint & Rust from Autos, Tools. Guaranteed! Send **$24.75** or write for free information. **Complete Flocking Supplies!**

Only $24.75 complete

BLASTO SPRAY GUN MFG.
Dept. PS-3, 7007 Haas Ave., Los Angeles 47, Calif.

Scrape paint quickly

ask your dealer for

Red Devil

Wood Scrapers

Send for the *NEW* 96 page Red Devil catalog No. 21

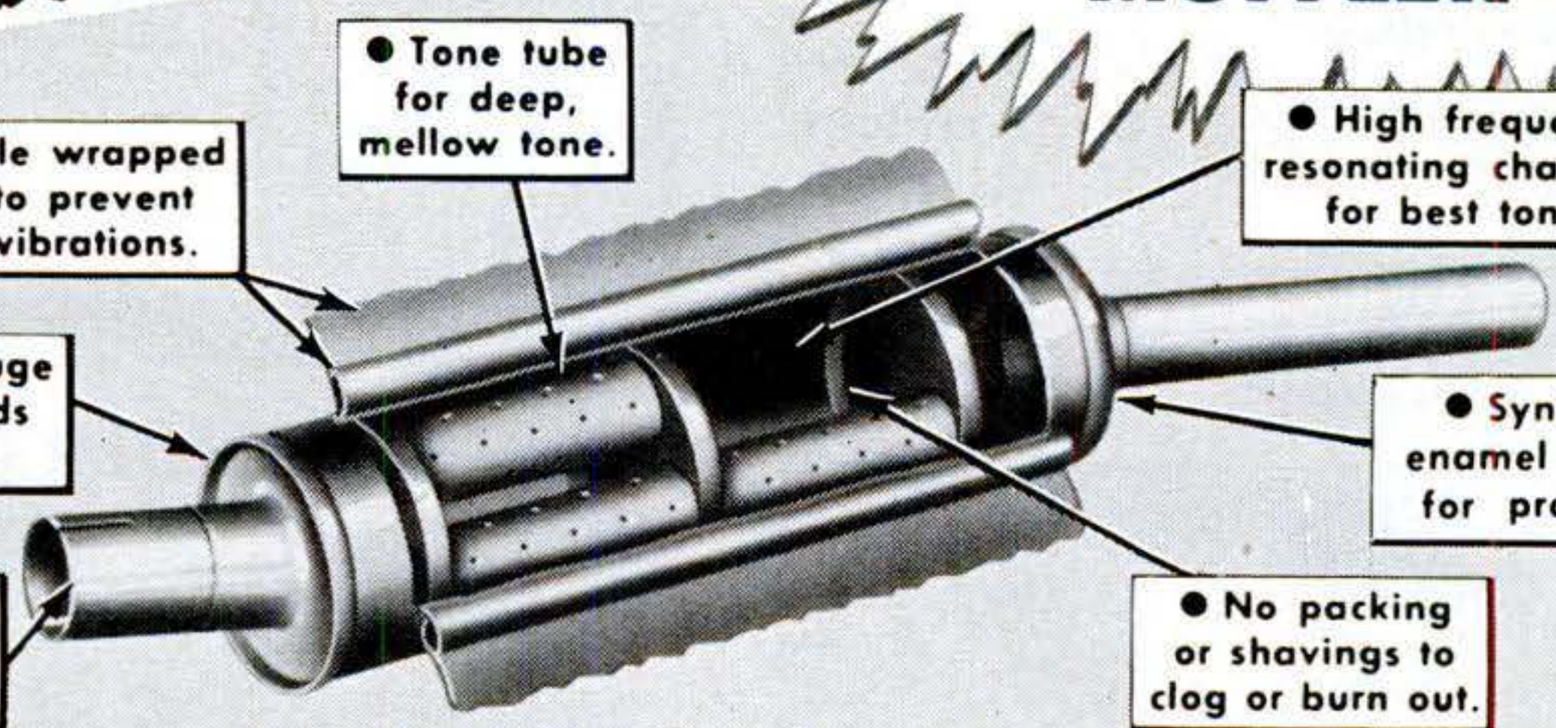
Address Dept. P.S.

RED DEVIL TOOLS, IRVINGTON 11, N. J., U. S. A.

Copyrighted material

THERE'S NO OTHER MUFFLER LIKE DYNATONE

DYNATONE
Deep, Mellow Tone MUFFLER



ENGINEERED—Not Packed

YET COSTS LESS THAN MOST HOLLYWOOD MUFFLERS!

The Dynatone has guts! It's the *only* special muffler *engineered* for your car. You'll go for its deep, mellow tone—and you'll go for these features, too —

- Lower back pressure
- More power
- More gas mileage
- Longer Life
- No tinny vibrations

Listen to a phonograph recording of the Dynatone at your automotive dealer. Or write us for the name of your nearest dealer.

GOERLICH'S 621 Smith Street • Toledo 1, Ohio

BUY

STRYPEEZE

THE SAFEST PAINT REMOVER You Can Use

Beware of removers giving off toxic fumes from inflammable benzol, and poisonous, non-inflammable types. Strypeeze contains no benzol, no chlorinated solvents . . . it's the *safest* paint remover you can use.

Write for helpful FREE circular

- Stays wet longer
- Removes more coats
- Clings to upright surfaces
- Harmless to hands and surfaces
- Needs no after-wash

SOLD WHERE YOU BUY PAINTS

SAVOGRAN

25 Huntington Ave. Dept. 44 Boston 16, Mass.

send for **FREE CATALOG**

America's Foremost

money-making

MECHANICS' TOOLS

It's easy to own the same "pay-off" tools used and endorsed by America's top-earning mechanics throughout the automotive, aviation and industrial fields! Snap-on tools help you handle every repair job faster, easier, better. And they LAST . . . pay for themselves over and over again! Start building your own tool set now with basic Snap-on units—add others any time. Genuine Snap-on tools are never sold in stores —direct to users only. Mail coupon for free catalog.

Snap-on Tools
THE CHOICE OF BETTER MECHANICS

SNAP-ON TOOLS CORPORATION
8060-J 28th Ave., Kenosha, Wisconsin
Send me free catalog of Snap-on tools.

Name _____

Address _____

City _____ Zone _____ State _____

Copyrighted material

TURN YOUR CAR INTO A COMFORTABLE BED

You can
MAKE CONVERSION QUICKLY & EASILY
With Easy-to-follow
CAR BED PLANS

Ideal for HUNTERS, FISHERMEN VACATIONERS and ON OVERNIGHT TRIPS

Use your auto as private sleeping car and save money; rest in solid comfort.

WORKS ON 2 and 4-DOOR SEDANS CLUB COUPES & CONVERTIBLES

GUARANTEED TO WORK

only **$1.00** *for complete plans and instructions*

NO INSTALLATION CHARGES!—With Car Bed plans and instructions, you do converting yourself in spare time. Get necessary parts locally for less than $3.00. Give make, model, and whether 2 or 4-door. ACT NOW! Send check or money order.

Install a RADIO SPEAKER IN YOUR BACK SEAT

Insures listening pleasure for back-seat riders. Fits any car.

GUARANTEED—

We send 5" speaker, control switch, and complete plans. Anyone can install!

only **8.95**

Keep Bugs Out—Now! — Screens For Your Car Doors—

They fit snugly on outside of door . . . keep out mosquitos and other insects. Fits any car. Send make and model. Guaranteed Satisfaction or Your Money Back!

Set for 2-doors 5.95

Set for 4-doors 7.95

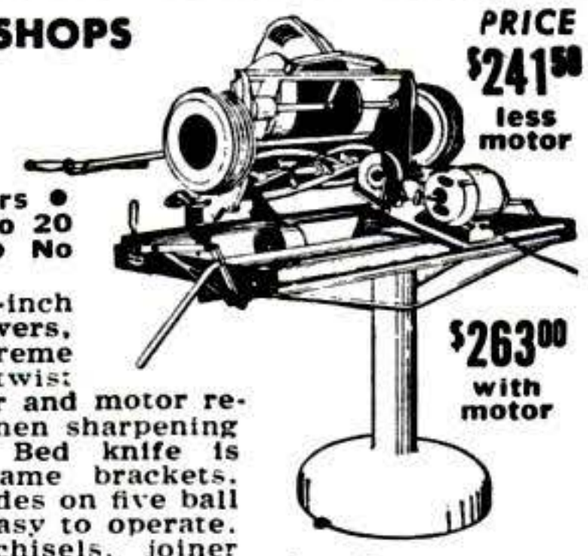
Dealer Inquiries Invited

ORDER TODAY!—No C.O.D.'s please! Shipped Postpaid. Send check or money order.

AUTO BED COMPANY
305 East 6th St. Panama City, Florida

MODERN LAWN MOWER SHARPENER

FOR LAWN MOWER SHOPS FIX-IT SHOPS GOLF COURSES • PARKS 101 OTHER JOBS



PRICE $241.50 less motor

$263.00 with motor

Sharpens All Reel Type Mowers • Hand, Power or Gang • 10 to 20 Minutes • No Dismantling • No Extra Attachments Needed.

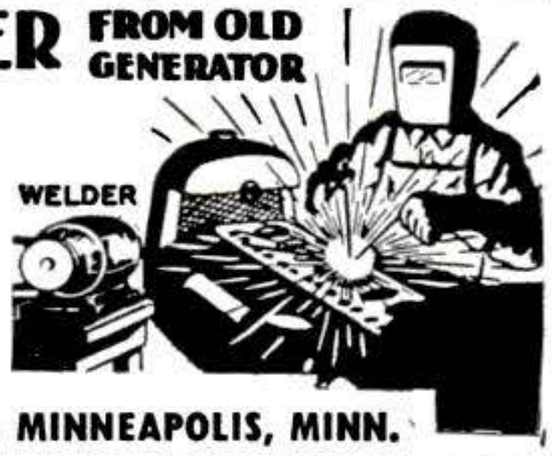
All reel type mowers, from 5-inch edgers to 36-inch power mowers, are quickly sharpened to extreme ends of both left and right twist blades. Handle, wheels, roller and motor remain in place when sharpening is in process. Bed knife is sharpened in same brackets. Grinding head rides on five ball bearing races. Easy to operate. Also sharpens chisels, joiner knives, planer blades. Big profit maker. Own your own business. Send Today for **FREE Illustrated Bulletin No. 11-C1.** Prices Subject to Change Without Notice.

ORDER NOW Immediate Delivery

MODERN MFG. CO. 160 N. FAIR OAKS AVE PASADENA 1, CALIFORNIA

BUILD ARC WELDER FROM OLD GENERATOR

WE SHOW YOU HOW
Light or Heavy Work



Produces 75-200 amperes. Takes no previous experience or hard work to make one of these welders. Complete plans 35c. Send for your **PLANS** today and we'll include FREE our Big NEW Catalog listing hundreds of electrical bargains.

LEJAY MFG., 1323 LEJAY BLDG., MINNEAPOLIS, MINN.

ONE-MAN SAWMILL LOW AS $50.00 DOWN

Take BELSAW Portable Sawmill right to the trees—turn out valuable lumber for local yards—do "custom sawing" for neighbors. BELSAW lasts a lifetime. No crew needed. Power with old auto engine. Beginners get excellent results. Send postcard for FREE BOOK, "How To Make Lumber."

FREE BOOK

BELSAW MACHINERY CO
8463 Field Bldg. Kansas City 2, Mo.

DRAINS Cellars, Laundry Tubs;

CIRCULATES Oil; IRRIGATES Gardens

Original "Type P" Pump has 2400 GPH capacity. 360 GPH 75' high, or 1500 GPH from 25' well. Use any 1/8 to 1/2 HP motor. DOES NOT CLOG.

Only $6.95 postpaid if cash with order. (West of Mississippi, add 50c.) **$6.95**

SATISFACTION GUARANTEED OR MONEY BACK!

LABAWCO PUMPS, BELLE MEAD 3, N. J.

AMAZING NEW

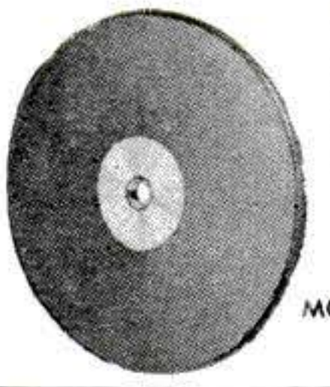
Wood-Turning Tools

OUTLASTS STEEL 50 TO 1!

These remarkable tools tipped with TUNGSTEN CARBIDE will astound you with their performance. They work FREE HAND equally well in wood, plastic or soft metals—and at the same time hold their razor-like edge almost indefinitely. Tests show that they will turn wood or plastic for days and days CONTINUOUSLY without showing any signs of dulling. They are the finest tools available at any price. Beautifully finished 5" blade—flush ground, polished tip—finest brass tube ferrule—9" hardwood handle—over all length 14"—25 tools to choose from: round and square nose from 1/8" to 1/2"; —1/8" cut off; 1/2"x30° skew, spear, r. & l. skews, turning and parting. Amazingly Low Prices! Write at once for free literature.

JOHNS MFG. CO., DUNELLEN 7, N. J.

GET THIS 8 Inch DISC SANDER FOR YOUR TABLE SAW



CHOICE OF 1/2, 5/8 or 3/4" ARBOR HOLE

SAND ANGLES, SQUARES, CIRCLES, ETC. ON YOUR CIRCULAR SAW. DISC COMES COMPLETE WITH FINE & COARSE PAPER ALREADY APPLIED ON OPPOSITE SIDES. **$4.95**

EXTRA SANDPAPER TO FIT DISCS ASSORTMENT OF 5 GRITS 80¢

MONEY BACK GUARANTEE • SEND CHECK OR MONEY ORDER

WRITE FOR CATALOG No. S-10

JAXON COMPANY • 369 ELLICOTT ST. • BUFFALO 3, N.Y.

USE KESTER METAL MENDER
(GENUINE TIN LEAD SOLDER)

For all Metal Repairs

FREE: "Soldering Simplified." 16 page illustrated booklet. Get your copy now.

Kester Solder Company
4254 Wrightwood Ave.
Chicago 39, Illinois

Copyrighted material

MILLER ROTARY
HI-SPEED COPE-SAW DRILL-BIT
IT DRILLS IT SAWS IT REAMS

DRILL, SAW, REAM metal, pipe, wood, plastic, Transite, etc. Use with any electric drill slow drill press, lathe or milling machine Drills own starting hole—upper part of bit is used to cut, saw or ream circles, ovals, squares or scrolls. Easy to operate. Ideal for carpenters, mechanics, electricians, plumbers, hobbyists, many others Abrasive resistant, high speed steel. Flutes ground from solid. Will withstand severe continuous use without breaking. Resharpened at no charge. Takes place of up to $50 in tools ¼" diameter, 2" cutting sections, total length 3½" Also available specially designed for wood or metal and in 2⅜" and 1¾" lengths. Write for details Specify all-purpose bit. Shipped same day. Money-back guarantee Dealer inquiries invited

SEND CASH, CHECK OR MONEY ORDER

Manufactured and distributed by:

INTERNATIONAL TWIST DRILL CORP.

624 Wyandotte, Rm. 694, Kansas City 6 Mo.

only $3.95 POST PAID

SHIP MODEL MAKING

New book shows how to make any model. Shows the short cuts, kinks, time-saving methods of experts. Complete plans for gorgeous galleon, clipper ship, etc. Almost 100 illustrations. Full cloth bound $2.00. **Popular Science Monthly, Dept. 1051, 353 Fourth Ave., New York 10, N. Y.**

New Accurate 10" SLIDE Rule

FOR STUDENTS, BEGINNERS
—for everyday economy
- **white lacquer coated face**
- **scales A-B-C-D-C1-K**
- **Metal framed indicator**

For multiplying, proportions, division, extracting roots—difficult calculations at lightning speed without paper or pencil. Easy to learn!—ABC 32 page Instruction Book **FREE. $1.00** postpaid.

Professional Model: Scaled A-B-C-D-C1-K-S-L-T

●Contact hairline index on back of rule insures accurate reading of "trig" Scales. With Leather Case, instruction book, **Complete. $2.00** postage paid.

$1 POST PAID

MINI-ADD, Dept. PS-10, 108 5th Ave., New York 11, N. Y.

When Writing to Advertisers, Mention Popular Science

NO FROZEN PIPES

When You Use WRAP ON ELECTRIC HEATING CABLE

Protects to 35° *Below* Zero

No more worry, expense or inconvenience from frozen pipes! Just wrap plastic coated cable around exposed or shallow underground pipes and plug into 115 volt outlet. Maintains low heat—like electric blanket. Uses only small current. Thermostat turns on only when needed. No radio or TV interference. Low prices—complete with connections—from one dollar. Satisfaction or money back.

E-Z-WRAP Pipe Insulation. Thick blanket of glass fibres. Vapor seal wrapping. Conserves heat. Gives greater protection. Easy to apply. Stops drip from cold pipes in hot, humid weather. Saves heat on hot water pipes. $1.00 per package. Covers 17 ft. ½" pipe. Write for full information and **free catalog.**

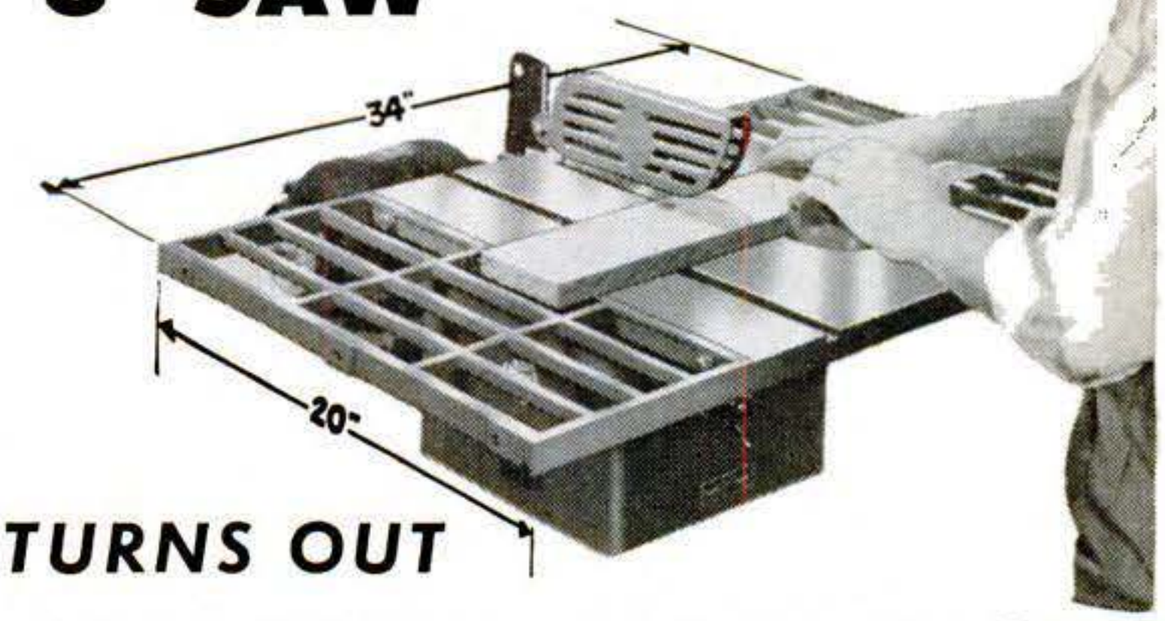
CLYDE J. SMITH CO.

11141-7 Morang Ave., Detroit 24, Mich.

Free Catalog

You'll *Prize* This Saw Year After Year

Atlas POWER KING 8" SAW



TURNS OUT MORE WORK—FASTER, EASIER!

Zip through a board with this Power King and you'll know you've picked *the* saw for your shop! Everything about it — big *precision ground table, ball bearings, tilting blade, exclusive rip fence* — combines to add to your craftsmanship, save you time. It's big enough to help you build a home, remodel rooms, make large furniture — yet smooth and accurate enough for the finest hobby work. See it at your Power King dealer's today, or send postcard for complete catalog of all 8 Power King tools.

OUTSTANDING FEATURES

- **Tilt/Arbor, Ball Bearing Construction!**
- **11½" Table Surface Ahead of Blade on 1" cut!**
- **2⅝" Depth of Cut!**
- **16" x 20" Table. 34" x 20" with 2 Extensions!**
- **Finest Rip Fence of All!**

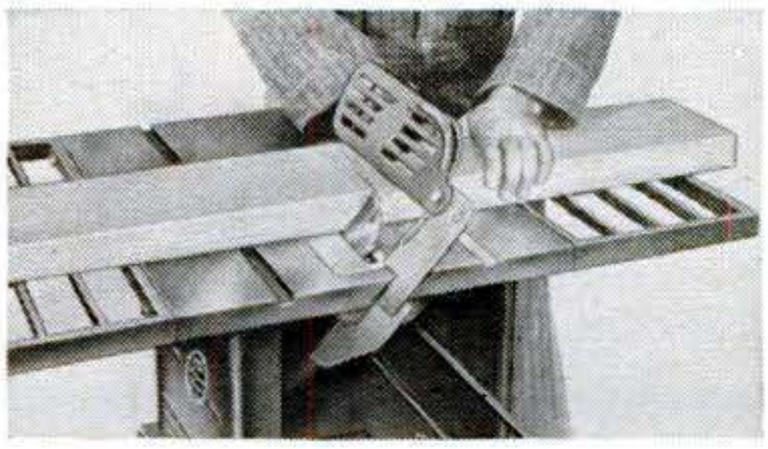
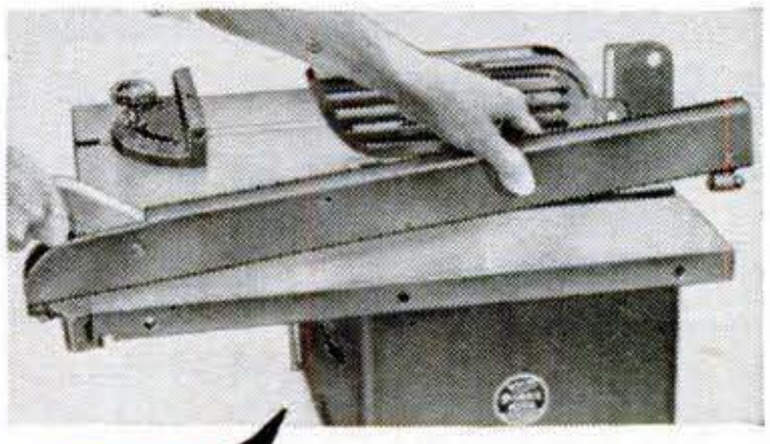


Table and work stay flat for angle cuts. Safer — more accurate!



Fence locks at *both* ends. Lifts off easily, positions instantly!

40TH YEAR

Atlas ATLAS PRESS CO.

1042 N. PITCHER ST. • KALAMAZOO, MICH.

Copyrighted material

SAVE OVER 50%

ON THESE BRAND NEW WAR SURPLUS POWER UNITS

BE PREPARED
for any emergency!

LIGHT PLANT BUYERS—
in emergency telephone collect—unit shipped same day!

5 KW Plant, 120 volts, 60 cycle AC. List today $1910.00 Used $675.00 NEW. Your price only

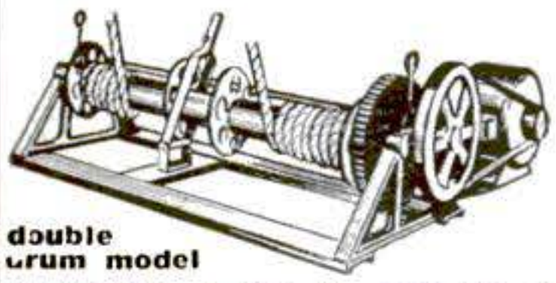
$895.00

2500 Watt, AC, 110 volts, 60 cycle. Slightly used but reconditioned and fully guaranteed ONLY **$295.00**
NEW, same as above **$345.00**
Plants built in 1951 .....**$426.00**
3000 Watt, 110-220 volts, with AUTOMATIC battery starter.....**$465.00**
300 Watt, Reg. $145, Now.....**$99.00**
750 Watt.....New **$232.00**
1000 Watt AC.....New **$248.00**
1500 Watt AC.....New **$275**
2000 Watt AC.....New **$299**
3000 Watt DC Contractor's PORTABLE. Rubber tired wheels, 5 to 7 HP gas engine. Used like new $220.; New **$279.00**
7500 Watt 4 cyl. engine; New **$995.00**
10,000 Watt Used $1195.00; New **$1495.00**
25,000 Watt Used $1995.00; New **$2495.00**
35,000 Watt Diesel, Rebuilt..**$2995.00**
50,000 Watt Diesel, New.....**$5900.00**

BARGAIN SPECIALS!!

Ball-Bearing Arbor . . **$6.95**
Alarm Siren or Horn **$15.45**
Mercury Heat Control **$6.95**
Electric Hot Water Heater, 10 gal. **$24.95**
Hot Rod Supercharger **$31.00**
NEW 2½ HP Briggs & Stratton. AP Lists at $103. . **$54**
Gear reducer, 80-1 ratio List $45.00. Only **$22.00**
Aircraft heater, 50,000 BTUs, Value $125. Only **$12**
Ohm meter, 0-25, leather case, List $29.50 Only **$7.95**
½ Ton Shop Wagon, rubber wheels, Value $69.00 Only **$48.00**
Air Compressors, ⅓ to 10 HP, large savings!
Heavy duty ¾ HP Electric Motor, 110-220 V, AC, mfr'd by B-line or GE. Lists at $74.00 Only **$42.00**

SENSATIONAL WINCH VALUES



double drum model

For—Contractors, Boats, Farmers, Trucks, Loggers, etc.
WINCHES, 1,000 lb. capacity. Hand operated.....**$ 8.50**
WINCHES. 6,000 lb. capacity. Hand operated.....**$29.50**
WINCHES, 1,500 lb. capacity. Hand operated.....**$39.50**
WINCHES, 6,000 lb. double drum. Hand operated...**$49.50**
WINCHES, 1,500 lb. capacity. Electric drive.....**$ 89.50**
WINCHES, 6,000 lb. capacity. Electric drive.....**$188.00**
CABLE, preformed stainless steel aircraft; 100 ft. or less, 17c per ft.; over 100 ft., 15c per ft.

Thousands of $$ saving buys. These are a few of the many items at sensationally low prices!

Pumps Drop Cords Fire Pumps Clutches
Grinders Generators Saws Air Tanks

C&H ELECTRIC MACHINE Co. Inc.
438 W. Juneau Ave., Milwaukee 3, Wisconsin

FREE Book on Painting

Get this illustrated 24-page book absolutely free. Full of facts on how to get better results with aluminum paint—which type to use for different jobs. Absolutely no obligation—just write:

ALUMINUM COMPANY OF AMERICA
1717K GULF BLDG., PITTSBURGH 19, PA.

DRILL PRESS OWNERS!

HERE'S 1 TOOL WITH 5 DISTINCT USES

THE BARRON MULTI-PURPOSE ROTARY WOOD PLANER

PLANES & SURFACES • PANELS & BEADS
ROUTS & GROOVES • RABBETS • TENONS

$7.50 COMPLETE

Finest precision performance—certainty of skilled workmanship—time-saving, money saving short cuts—yours with world famous Barron Drill Press Tools. Fifteen important operations—all available on any standard drill press—with Barron Accessories. Equip your shop with these versatile exclusively designed tools—and save up to $500. 200,000 Barron owners have bought on our liberal 10 day full money back guarantee. Order, or write for catalog.

FREE Workshop Guide & Catalog

BARRON TOOL CO. INC.
366 Architects Bldg., Detroit 1, Mich.

WELD IT YOURSELF IN A JIFFY!

Weld, Cut, Braze, Solder
IRON, STEEL, BRONZE, BRASS, ALUMINUM & OTHER METALS

Tool and Equipment breakdowns are always annoying and costly. Don't let them bother you. Get a Dynamic Arc Welder. You can do expert work on your very first job. Welders operate from any properly wired 110 V. AC line. The handiest "tool" in your workshop. A Dynamic Welder will save its low cost over and over again in time and money.

***Everything* YOU NEED**

One low price gives you a complete welding outfit ready to use. Save Money! Buy direct! Sold on 10 day money back guarantee. Send today for FREE details.

DYNAMIC INDUSTRIAL type transformer Arc Welder 75 amp. output for Industrial or Workshop use.

DYNAMIC WELDER CO.
Dept. D3-KB 13 E. 23rd St.
Chicago 16, Ill.

Free Details and "How to Weld"

BE YOUR NEIGHBORHOOD WOOD EXPERT
A *MUST* FOR HOME CRAFTSMEN AND HOBBYISTS!

The only wood sample kit on the market. Contains 54 specimens. 84 page identifying manual with 51 magnified cross sections, 10x hand lens and knife, and directions for 20 experiments Delivered anywhere in continental U.S All for only $8.50 postpaid

TIMBER ENGINEERING CO., 1319 - 18th St., N.W., Washington 6, D. C. (PS)

MAKE $25 to $50 A DAY

Installing the Amazing New

REDI-WARM

AUTOMATIC ENGINE TENDER

The most widely publicized auto accessory on the market today. Redi-Warm insures instant starting, regardless of weather conditions. Consists of three simple units that can be easily installed on any type of car. No technical experience necessary. We show you how to do it, and how to make the biggest week's pay you ever dreamed of. Write or wire for territory reservation.

CRAY-LINCOLN ENG. & MFG. CO.
Cray Oil Bldg. No. Walpole, N. H.

WOODCARVING and WHITTLING

AN ARTISTIC HOBBY FOR ALL

This new manual shows you how to do every kind of wood carving. How to carve jewel boxes, picture frames. trays, chests, furniture, etc. How to do chip carving, level surface carving, incising, carving in relief. Carving human and animal figures in the round completely explained and simplified. 256 Pages. Fully illustrated,—full cloth bound. Send only $2.00 and your copy will be sent postpaid, or order COD plus postage if you wish.

Money back if not satisfied.

Popular Science Monthly—Dept. 1051
353-4th Ave. New York, N. Y.

Copyrighted material

Build It, Fix It

with

AMBROID

"It stays stuck!"

Dries entirely by evaporation of the solvent. Quick setting—no distortion. Ideal for assembling, repairing, home crafts, electrical work, factory, workshop or household use. Send postcard for free literature.

Try Ambroid in your business, too. For over 40 years recognized as the leading industrial adhesive of its type.

- **Ready-to-use**
- **Fast drying**
- **High tensile strength**
- **Transparent**
- **Waterproof**

Art galleries, museums, and leading industrial concerns, rely on AMBROID

Try a tube today.

At most hardware stores and hobby shops. If your dealer cannot supply you, send 25c for big 2 oz. tube, postpaid. Money back guarantee.

AMBROID 306 FRANKLIN ST. BOSTON 10, MASS.

NEW 1951 KING MIDGET AUTO

WORLD'S LOWEST PRICED 2 PASSENGER CAR. Drive it for 75c per week. Amazing performance. Surprising comfort. All steel construction. Full accessories, top and heater. Ready to run or assemble it with our bolt together parts. Rider agents wanted, earn your car Free. Send 25c for detailed literature or $1 (refunded first order) for actual assembly book and service manual filled with photos, drawings, specifications, etc.

MIDGET MOTORS MFG. CO.
ATHENS, OHIO

NOW—40 different CUTS with AMAZING, NEW *Warren*

DADO SAWING WASHERS *On Your Saw Blade*

Just dial widths to cut parallel grooves perfectly smooth. No warp, vibration or trick screws. Strengthens blade, perfect balance. GUARANTEED! At your dealer's or order direct. Give arbor size—½", ⅝", ¾", 1".

ONLY $4.95 PER SET

Send for free booklet

WARREN WASHERS COMPANY
70 Medbury, Detroit 2, Michigan

A $245.00 WORKSHOP COMPLETE FOR ONLY $96.75*—BUILT WITH MY

SKIL Home Shop Tools

My workshop is the envy of the neighborhood, and I built it *by myself* with my SKIL Home Shop Saw and Table, cutting building costs more than half! I paid only for materials.

I'm no great shakes as a carpenter, but with SKIL-Chart #106 as a guide it was a cinch to build this shop in spare time.

My SKIL Home Shop Saw has plenty of reserve power. It is easily converted to a tilting arbor table saw with my SKIL Saw Table. It miters, bevels, cross cuts and rips with complete accuracy!

You'd be surprised at the number of things you can build for the house with SKIL Home Shop Tools! When friends visit *my* workshop I love to show 'em how these tools can pay for themselves with the money they save!

SKIL Home Shop Saw—Model 520. Fast, accurate, powerful 6" saw. Full adjustments for bevel and depth of cut. No-load speed: 5800 r.p.m. Automatic blade guard. Overall length: 10⅛". Weight: 10½ pounds. $59.50.

Prices subject to change without notice.
*For materials only. Local prices vary.

SKIL home shop Tools

Made only by Skilsaw, Inc.
5033 Elston Avenue,
Chicago 30, Ill.

In Canada: Skiltools, Ltd.,
3601 Dundas Street West,
Toronto 9, Ont.

Skilsaw, Inc., Dept. D-101
5033 Elston Ave., Chicago 30, Ill.

FREE! SKIL-Chart No. 106 shows you how to buy materials and build the workshop shown above.

Name.....

Street.....

City.....*State*.....

Copyrighted material

Rustproof Metal!

"KRYLON-*ize*"

home and garden tools—fishing rods and other sports equipment—nailheads and screwheads — children's playground equipment — lawn furniture—screens—hundreds of other objects!

If you prize it— "KRYLON-*ize*" it!

Krylon is a miracle of modern chemistry—a crystal-clear ACRYLIC coating that seals out water, air, moisture, dirt. Just press the button on the aerosol can and spray Krylon on. That's all there is to it! Krylon won't change color, crack or dry out. Waterproof, non-flammable. There's absolutely nothing like Krylon. It's America's *Acrylic* spray. Spray Krylon on almost any paper, leather, wood or metal surface. Protects, preserves, beautifies. "KRYLON-IZE" leather bags and luggage, valuable papers, photographs, washable walls, etc., etc. Hundreds of uses in every home! At hardware and paint counters everywhere in the big 12 oz. aerosol spray can.

KRYLON is also available in ALUMINUM and BRIGHT WHITE
All the qualities of clear Krylon, plus brilliant color. Go farther, last longer, clean easier, easier to apply than paint or enamel. Big 12 oz. aerosol spray cans.

KRYLON, INC.
2601 N. Broad St.
Philadelphia 32, Pa.

Say "KRYLON" at Your Hardware Counter

QUICK-ON, STAY-ON, SPEED NUTS®
NOW IN HANDY TINKER KIT

SPEED NUTS—famous throughout industry—now ready for home use. Ideal for repairing or attaching sheet metal parts on toys, appliances, etc. Kit contains over 100 parts—10 popular size nuts and matching screws. Replace threaded nuts and lock washers this fast, sure way. Tinnerman Products, Inc., Dept. 13(A), Cleveland 1, Ohio.

ONLY $1.00
Including Postage
CASH or CHECK ONLY

VISE-GRIP WRENCH

MEANS POWER and PERFORMANCE ON ANY JOB

Low As $1.85

GIVES HAND TON-GRIP

Do repair work in the home, shop or factory the easy way—with VISE-GRIP. LOCKS with TON-GRIP . . . turns anything from the smallest screw to the largest nut or bolt. Has more uses than a dozen ordinary tools. Makes ideal Pipe Wrench, End-Wrench, Pliers, Clamp, Toggle Press. With Cutter: No. 7W, 7", **$2.25;** No. 10W, 10", **$2.60.** Without Cutter: No. 7C, 7", **$1.95;** No. 10C, 10", **$2.25.** No. 7, 7", **$1.85;** No. 10, 10", **$2.15.**

ORDER FROM YOUR DEALER

PETERSEN MFG. CO., Dept. P-10, DeWitt, Nebr.

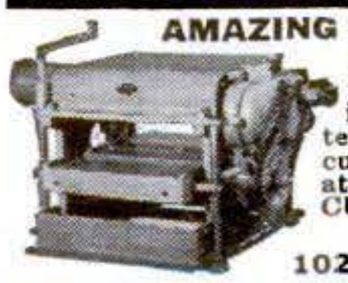
FIRING FORGING MELTING

UTILITY OIL BURNER
BUILD YOUR OWN FURNACE
Save Time and Money

Do your own HARDENING, TEMPERING, ANNEALING, BRAZING, BENDING, ASSAYING, FORGING, BAKING, CASTING, FIRING. Cut costs tremendously. Complete instructions furnished for building kilns, forges, furnaces, with castable refractories. Burner converts kerosene, #1 and #2 fuel oil into a clean hot gas flame. Fires into open and into furnaces with controllable atmosphere. Up to 3000°F. A neat, compact, portable unit ready to operate. Burns ½ to 1½ gals. per hour; 50-200,000 Btu/hr. Wide heat range. 26" x 10" x 9"; 22 lbs; 110 v., 60 cycles.
Write for complete information. Tell us your requirements. Immediate delivery. Price $89.50 FOB factory. Satisfaction guaranteed.

STODDARD PRODUCTS CO., Inc., 66 Amity Road, New Haven 15, Conn.

DO MORE PLANING JOBS WITH LOW-COST BELSAW $215.00



AMAZING 12¼-IN. PLANER Does All Ordinary Planing Mill Jobs. Provides attachments for Jointing, Rabbeting, Tongue, Groove, Matching. 12¼ x 6-in. capacity, 3-knife solid round all-steel cutterhead. Power feeds at 24 feet per minute, 42 cuts per inch. Provides for full line of accessory attachments—Grind and Joint knives IN THE CUTTERHEAD WITHOUT REMOVING.

FREE BOOK

BELSAW MACHINERY CO
1021 Field Bldg., 315 Westport Rd., Kansas City 2, Mo.

HOLD-E-ZEE
The Original
AUTOMATIC GRIP SCREWDRIVERS

Hold, start and set up screws in unhandy places. Gripper instantly released by SPRING ACTION, sliding up out of way when not in use. Highest quality throughout.

New Models FOR RECESSED HEAD SCREWS ⊕ ⊕

UPSON BROS., INC., ROCHESTER 4, N.Y. *At Leading Dealers Everywhere*

Copyrighted material

SURPLUS MACHINE SHOP TOOLS AT PRICES YOU CAN AFFORD

HIGH SPEED STRAIGHT SHANK DRILLS

SET 7T — 10 Different Size H.S. Straight Shank Jobber Length Drills, ¼" to ½". (shank same dia. as drill) $25 Value, only..... **$3.95**

HIGH SPEED DRILLS

¼" to ½" with ¼" Shanks
½" to 1" with ½" Shanks

SET 35T — 6 Different Size H.S. Drills, ¼" to ½" all with ¼" shanks..... **$3.50**

SET 36T — 10 of above **$4.95**

Set 35T and 36T will fit any ¼" drill.

SET 32T — 5 Different Size H.S. Drills, ½" to 1" with ½" shanks **$6.95**

SET 33T — 10 Different Size H.S. Drills, ½" to 1" with ½" shanks **$12.95**

These H.S. precision drills with ½" shanks can be used in a ½" electric drill or a ½" capacity lathe or drill press.

HIGH SPEED MORSE TAPER SHANK DRILLS

SET 10T — 20 Different Size High Speed Morse Taper Shank Drills from ¼" to 1". $70 Value. Priced at only..... **$12.95**

SET 15T — 10 Different Size High Speed Morse Taper Shank Drills from ½" to 1¼". $50 Value. Priced at only..... **$9.95**

SET 37T — 8 Different Size High Speed Morse Taper Shank Drills from 1" to 2" with No. 3, 4, and 5 tapers. $125 Value. Priced at only **$29.95**

HIGH SPEED HAND TAPS

SET 1T — 8 Different Size High Speed Standard Thread Hand Taps up to ¾" including 2 std. High Speed Pipe Taps **$2.95**

SET 40T — 16 same as above..... **$4.80**

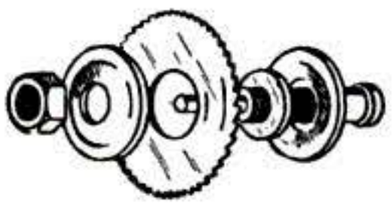
HIGH SPEED TAPER SHANK CHUCKING REAMERS

SET 25T — 15 Different Size High Speed Morse Taper Shank Chucking Reamers up to ½" with No. 1 and 2 tapers. Priced at only **$6.95**

13T — 8 Different Size High Speed Morse Taper Shank Chucking Reamers from ¼" to 1". Priced at only..... **$4.95**

SET 12T — 10 Different Size High Speed Morse Taper Shank Chucking Reamers from ½" to 1⅛". $65.00 value. Priced at only **$9.95**

6 Slitting Saws with Mandrel



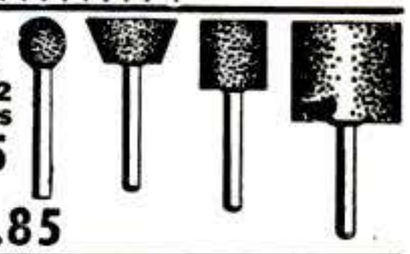
SET 34T — 6 Different Size High Speed Slitting Saws, 2¾" dia. x 1" arbor. Thickness from .040 to .071. Cuts wood, aluminum, brass, steel, etc. PLUS SPECIAL MANDREL which enables use of saws in ¼" or ½" elec. drill. $25 Value. Only..... **$4.95**

NEW HIGH SPEED COMBINATION DRILL AND COUNTERSINKS

SET 2T — 8 selected sizes from C2 to F2 (1/16 drill x 13/64 body to 3/16 drill x 7/16 body) 60 degree angle of countersink. New cost on these countersinks 75c to $2.50 when available. Your price for set of 8, only **$4.95**

High Speed Straight Flute Expansion Reamers

NEW reamers now in stock. Size B-17/32 to 19/32, D-21/32 to 23/32, E-23/32 to 25/32. Mfg. by Cleveland Twist Drill. Price on any one of above three sizes — only..... **$3.25** ea.

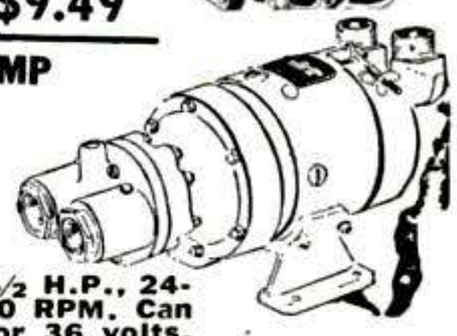


NEW MOUNTED STONES

SET 27T — Mixture of 12 Mounted Stones with ¼" shanks. **$2.95**

SET 39T — 24 of above **$4.85**

P1A PESCO PUMP gear type, displacement 1¼ GPM at 1500 PSI. Continuous operating speed, 3750 RPM. Pump is driven by ½" Spline. Dis. on Quan..... **$9.49**



BRAND NEW PUMP AND MOTOR

Pump has 1" connections, built-in relief valve, adjustable up to 1500 lbs. Max. capacity 6 GPM. 1½ H.P., 24-volt motor. 4000 RPM. Can be used on 12 or 36 volts. 500 units available at quantity discounts. Both pump and motor only..... **$13.95** F.O.B. TULSA

Money-Back Guarantee—All Mdse. Mixture of New and Reconditioned Tools Unless Specified Brand New—All Orders (Except Those Specified F.O.B. Tulsa) Are Shipped Post Paid, saving you up to 25% on total delivered cost.

Write for Free Catalog Describing Thousands of Bargain Cutting Tools.

T & T TOOL 221 W. SECOND TULSA, OKLA.

The easy way to paint!

Speedy Sprayer

ONLY $32.50 LESS MOTOR

Favorite of home owners and craftsmen for 20 years! SPEEDY SPRAYER gives your work that professional paint finish everyone admires. Sprays paint, enamel, varnish, lacquer, etc. . . . 4 to 7 times faster than hand brushing! Lightweight, portable, uses any ¼ H.P. motor. Improved diaphragm principle assures clean, oil-free air. You'll find dozens of time and money saving uses for SPEEDY SPRAYER, including spraying insecticides 2-4-D and DDT. Complete outfit, without motor, only $32.50.

At leading hardware, lumber, and auto supply dealers.
FREE—*write for handy booklet "How to Spray."*

W. R. BROWN CORPORATION
2637 N. Normandy Ave. • Chicago 39, Ill.

Send for this BIG NEW Hunt's WOODWORKERS CATALOG NO. 18

ONLY 15c

NEW LOW PRICES

Offers greatest selection of fine domestic and imported woods--and hundreds of woodworkers items at bargain prices!

You'll save time and money with this big, new catalog. Contains everything wood craftsman needs. Shows 32 rare and fancy woods in color...43 veneer designs...275 scroll patterns...multicolor inlays, overlays, bandings...all kinds of tools, machinery, cabinet hardware, ornaments, mouldings...and pages of valuable tips, ideas, information, instruction. Send for your copy NOW. Only 15c.

144 PAGES

QUICK DELIVERY
on maple, poplar, oak, mahogany, red cedar, cherry, walnut, and many others—all properly seasoned and kiln dried.

MAIL THIS COUPON--TODAY!

CRAFTSMAN WOOD SERVICE CO.
2729 S. Mary St., Dept. B-10
Chicago 8, Illinois

Send me the big, new, money-saving Catalog No. 18. Enclosed is 15c.

Name_____
Address_____
City_____ Zone____ State_____

Copyrighted material

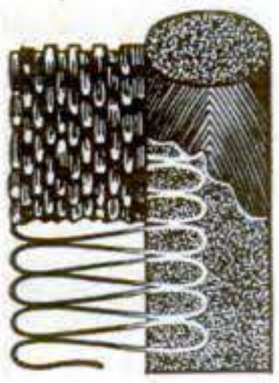
SEAL UP LEAKY DOORS AND WINDOWS WITH

INNER-SEAL

Live Rubber

WEATHERSTRIPPING

STAYS LIVELIER LONGER . . . SAVES MORE FUEL



RESISTS WEAR . . . waterproof neoprene coating preserves it.

TOUGH AND SPRINGY . . . live sponge rubber bead.

FLEXIBLE, INSTALLS EASY . . . woven spring-wire attaching strip, fits corners easily, accurately.

WHAT'S THE "JUMP TEST"?

Ask at your hardware or building supply store.

DYNAMIC POWER TOOL COMBINATION

INCLUDES

Cummins ¼" Electric Drill; Cummins Saw Attachment; Combination Saw Blade; Set of Drills; Lambs Wool Bonnet; 6 Sanding Discs; Steel Arbor and Attachments; Cloth Buffing Wheels; Grinding Wheel; Wire Wheel Brush; Steel Paint Mixer; Steel Bench Stand; Portable Steel Carrying Case.

Price of Dynamic Power Tool Combination complete is $26.95

only $2.95 DOWN

Balance $4.00 per month for 6 months.

NO INTEREST OR CARRYING CHARGES ADDED

KAPNER HARDWARE, INC.

Dept. B-7 2248, Second Ave., N. Y. 29, N. Y.

STOPS LEAKS *PERMANENTLY*

Cut your fixture replacement, water and fuel bills with Economy Renewable Seats. Make economical, permanent repairs quickly and easily with the Junior Kit (illus.). Repair bathroom, kitchen and laundry fixtures. Everything you need included in steel box. This is a natural for the "Fixit" shops—get extra income from making permanent repairs on your customers' faucets.

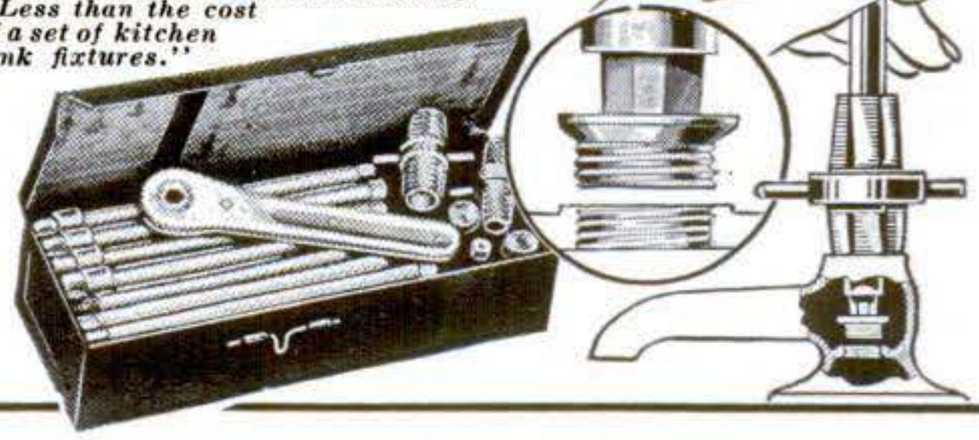
Senior Master Kit also **available**—repairs faucets and valves up to 1" pipe.

Write for illustrated circular

JUNIOR KIT, only $22.50

with 15 assorted Renewable Seats

"Less than the cost of a set of kitchen sink fixtures."



ECONOMY VALVE SEAT CO.

1426 N. Keating Ave., Chicago, Ill.

SAVE TIME WORK MONEY!

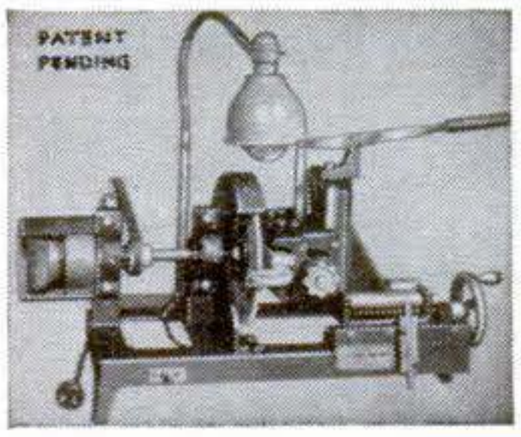
SHAW DU-ALL

FOR FARM OR GARDEN WALKING OR RIDING TYPE

These rugged walking or riding tractors are ideal for farm, truck garden. **FREE** Illustrated catalog giving complete details, price lists—write today.

SHAW MFG. CO.

5710 Front St., Galesburg, Kans.
668PS North 4th St., Columbus, O.



Start a NEW BUSINESS!

or Add to your present Repair Business

SHARPEN DULL PIPE WRENCHES

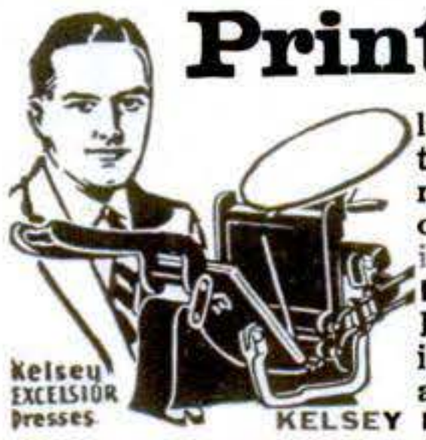
PIPE TAPS & DIES
"GUM" CIRCULAR SAWS

Write for Information

J. C. MOORE INDUSTRIES

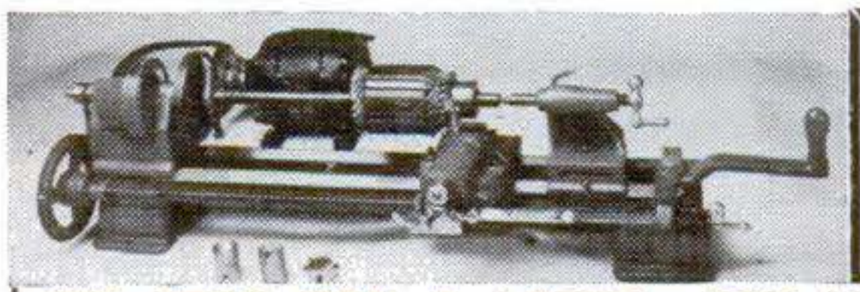
BOX S 276, Fredonia, Pa.

Print Your Own



Cards, Stationery, Advertising, labels, circulars, photo and movie titles, church work, tags, etc. Save money. Sold direct from factory only. Raised printing like engraving, too. **Print for Others, Good Profit.** Have a home print shop. Easy rules supplied. Pays for itself in a short time. Write for free catalog of outfits and all details.

KELSEY PRESSES, N-33, Meriden, Conn.



ONLY $59.95

FREIGHT PREPAID

WE SEND YOU A LATHE—NOT LITERATURE

To Prove by Trial the Biggest Lathe Value Ever Offered

You've read about other lathes—seen attractive color photos but you can't machine a thing with words or pamphlets. We won't send you literature but we will send you a brand new, top quality lathe, freight paid. We let you see our lathe—feel it—actually machine with it while you make up your mind to keep it or shove it back in the crate and return it freight collect. And what a lathe it is! Sturdily built with bed ways machined with double V to 60°. The compound swivels 360° on a center pilot and is locked with 2 T-slot bolts. Lathe may be operated with a ¼ h.p., 1750 r.p.m. motor. Bed length 26" with cutting range 18½". 6" swing. Sent complete with hand undercutter and lever hand feed, 2 female centers, 2 male centers, driving dog, V-belt, 2 power feed belts, tool bit, face plate and dog. The lathe is precision and sturdily built to handle every metal or wood job within it's dimension cap. Ideal for factories, hobby and home workshops or as armature lathe for garages. Full price freight paid only **$59.95.** 10 day free home trial—you must be satisfied or return it at our expense for your money back in full. Immediate delivery while they last. Send check or money order for **$59.95** to:

HAMILTON PRODUCTS, INC., 12416 Euclid Ave., Cleveland 6, Ohio

Copyrighted material

WELLWORTH AIR COMPRESSOR

For Farm and Home Workshop
Compressor has 2" bore, 1¾" stroke, 2.8 cfm up to 150 lb. pressure. Motor required: ¼ h.p. at 100 lbs.; ⅓ h.p. at 125 lbs.; ½ h.p. at 150 lbs. or equivalent gas engine. V-belt drive, intake muffler and cleaner, bronze bearings, splash lubrication. Wt. 16 lbs. Replacement parts always available..... **$20.50**

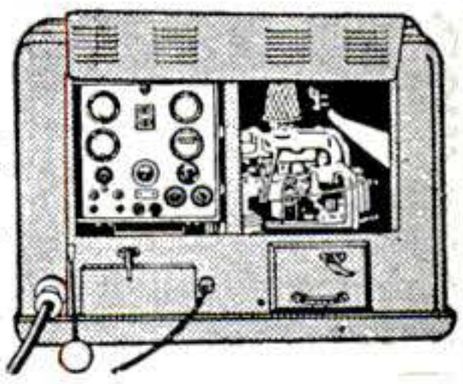
COMPLETE OUTFIT. Compressor, pressure tank, air gauge, air chuck, 20 ft. hose, pop valve, copper tubing with 4 brass flared fittings for connecting compressor to tank, 4-way cross and 3 nipples. COMPLETE OUTFIT. wt. 30 lbs. **$32.45**

Equipment less compressor **$12.45**
Tank only, $6.25

All Brand New Equipment

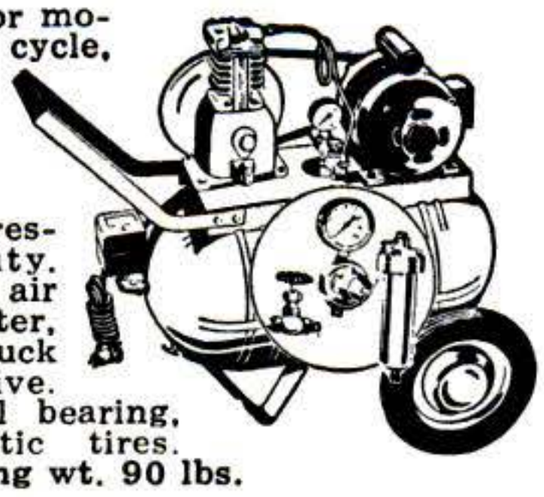
LIGHT PLANTS

Brand New!
Signal Corps Power Unit PE 197



115 volt 60 cycle A.C. single phase 5 K.W. Hobart, water cooled, 14 h.p. 4 cyclinder Hercules engine. **Remote Control,** complete panel board with instruments, 150 ft. automatic remote control cable with reel; 150 ft. #6 heavy duty wire with reel; housed in metal case with replacement parts and tools. Cable with reels alone worth $400. Regular price of unit $1900. Shipping wt. 1250 lbs. Our price, complete. **f.o.b. Chicago** **$895.00**

AUTOMATIC COMPRESSOR UNIT



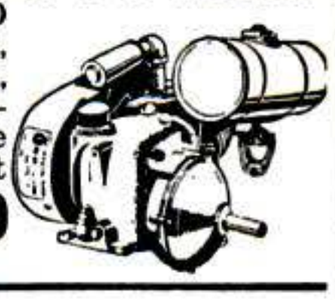
⅓ H.P. heavy duty capacitor motor. AC 110/220 volt, 60 cycle, 2x1¾ inch piston type compressor, splash feed lubrication. 12x24 inch tank, automatic pressure switch. CFM 2.8 at 100 lb. pressure, or 150 lbs. pressure for intermittent duty. Check valve, safety valve, air regulator with gauge and filter, 20 ft. air hose with air chuck for inflating tires. V. belt drive. Mounted on 2 wheels, ball bearing, with 2"x10" semi-pneumatic tires. **Portable with handle. Shipping wt. 90 lbs.**

With ⅓ h.p. motor **$160 Value.** **$98.50**
With ½ h.p. motor..... **$109.50**
Compressor only..... **$20.50**
Less Motor..... **$79.50**
With 1½ h.p. gas engine.... **$124.50**
Regulating gauge and filter..... **$8.95**

1/12 H.P. MOTOR

Delco 110-V, 60 cy. A.C., 1 phase 1750 r.p.m. 2 amps., will take 50% overload. Shaft 1⅜ x 1¼. Heavy duty, bronze sleeve bearing. Size 6" long, 5" high, net wt. 12 lbs. List $21.00. **Special** **$13.50**
Lots of 3, ea. **$12.50**

Red Seal Continental Gas Engine



BRAND NEW. 1½ HP with 6 to 1 reduction gear. Operates at 450 R.P.M. For lawn mowers, scooters, garden tractors, pumps, compressors, generators, etc. List Price $79.50. Shipping weight 54 lbs. SPECIAL PRICE..... **$47.50**

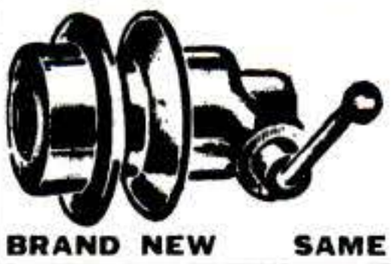
GENERATORS

. . . BIG VALUES

500 to 750 watt, A.C., 110-120 volt, 60 cycle. 1 phase output. Also 100 watt D. C. battery charging output. May be used at the same time. Voltmeter, 2 outlet boxes. Wt. 55 lbs. Price **$99.50**

Furnished with 1½ HP Engine with drive **$142.50**

WELLWORTH V-BELT CLUTCH



Takes starting load off engines or motors. When speed is reached, a flip of handle shifts clutch from idling to driving position. Handles "A" belts, 2.35" pitch diameter, ⅝" bore. Ideal for use with lawn mowers, garden tractors, home workshop motors, etc. 3¼" long. Safe, easy to mount, sealed bronze bearings, positive action. Shpg. wt. 3 lbs. **$7.50**

BUSHING FOR ½" SHAFT, 15c

BRAND NEW **SAME CLUTCH FURNISHED WITH ¾" BORE** **$8.50**

"WELLWORTH" BLOWER BARGAIN

BRAND NEW

Quiet operating. Double wheel inlet, double width blower. For heating, ventilating, cooling, air washing, exhausting and forced draft. DIMENSIONS: 10" wheel; outlet 13⅛" x 11⅜"; inlet 8¾". Height 19". Width 18". Depth 16½". C.F.M., ¼" S.P. 1600; outlet vel. 1575. Wt. 45 lbs.

BLOWER LESS MOTOR AND DRIVE..... **$27.50**

With belt and variable speed pulleys, $2.50 extra. (Motor required, ¼ h.p.)
Furnished with ¼ h.p. motor.... **$47.50**

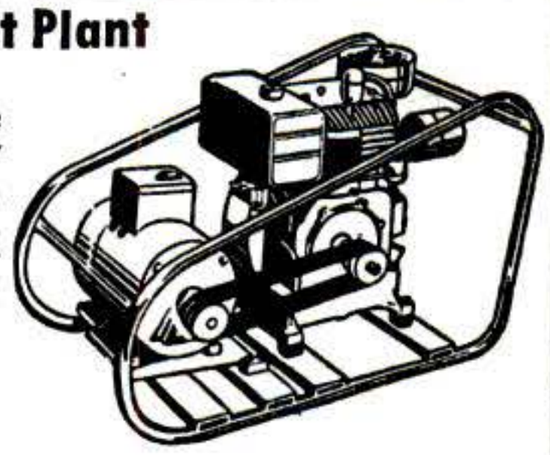
PRICES F.O.B. CHICAGO. MONEY BACK GUARANTEE. SEND CHECK OR MONEY ORDER TODAY. PROMPT SHIPMENT. **WRITE FOR CATALOG.**
SEND 10c FOR POSTAGE

WELLWORTH TRADING CO.

1831 S. STATE ST., Dept. B-10, CHICAGO 16, ILL.

2000-2500 Watt Light Plant

Heavy Duty Windings

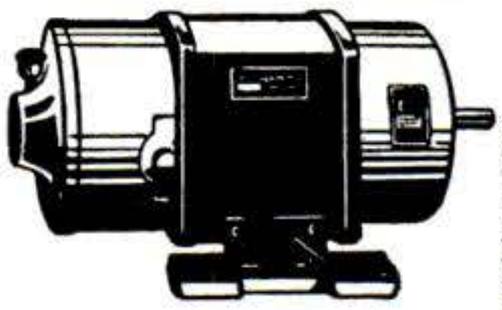


Floating Base for Automatic Belt Adjusting, 2-Groove Engine Pulleys, V-Belts, Bolts, etc. 4½ HP Engine, Briggs & Stratton Model 14 Engine, Voltmeter, 2 plug-in receptacles. Portable Tubular Steel Skid Type Carrier. Dim: L 34⅝" x W 17" x H 20"; Wt. 180 lbs.

$299.50

Same unit less mounting base..... **$275.00**
Generator only, with voltmeter, 2 plug-in receptacles, Shipp. Wt. 75 lbs..... **$169.50**

LELAND GENERATORS



2500 watts, 110 v. 60 cy. single phase 1800 r.p.m., self excited. 1951 model. Brand new, in original factory crate. Shipp. wt. 135 lbs. List $375. SPECIAL PRICE..... **$237.50**

Furnished with 6½ H.P. Briggs & Stratton gas engine (or equal) with drive. Wt. 251 lbs. List $750. SPECIAL PRICE **$395**

HOBBYISTS! SHOPMEN! *Special* ONLY $54.50

PALMGREN "HOBB-E" Rotary, Index, Milling Table
Ideal for Model Parts or Shop Work

Mill-Grind-Drill-Index-Rout curved or straight-Rabbet and Mortise on drill press or lathe. 8" Table, 4" Cross Feed, 360° Rotation, Accurately Graduated. Bolts to table. Order NOW! SAVE $100. Only **$54.50.** Less Rotary Feed **$43.75.** Write for **"HOBB-E"** Tool Circular.

CHICAGO TOOL and ENGINEERING CO.
8396 South Chicago Ave. Chicago 17, Ill.

BULL HACKSAW

for any ¼" electric drill or drill press

Easy to carry, easy to use—a "must" for every home craftsman! Full chip clearance on any wood, metal or plastic stock up to ¾". No gears, no bearings, nothing to wear out. Weight: 11 ozs. Guaranteed and only $4.95!

POWERFUL! PORTABLE! POCKET-SIZE!
$4.95

Send Cash, Check or M. O. Today!

BERTRUM O. ENGINEERING AND SUPPLY CO.
3125 Harrison St. Kansas City, Mo.

Start Your Own Welding Business with a HOBART "Simplified" arc welder

Go after WELDING jobs that *Pay Big Money!*

Write today for complete details on this **Profit Making Equipment** No Obligation

Never before has the demand for welding been so great—the profits so large. That's why smart operators everywhere are setting up their own welding business . . . and you can do the same.

SIMPLY CHOOSE from our complete line, the welder that best suits your needs—gas or electric drive—portable or stationary. The big pay jobs are waiting, so don't miss this opportunity. Write today.

"One of the world's largest builders of arc welders"

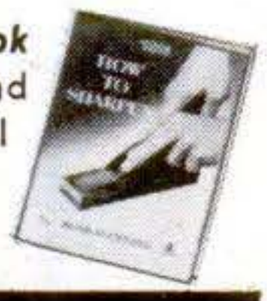
HOBART BROTHERS CO., Box P-101 Troy, Ohio

Copyrighted material

abrasives INDIA® FILES

These handy formed file stones give that final touch of keenness to auger bits, countersinks, formed plane cutters and other hard-to-reach edges. Indispensable, too, for work on gun parts, reels, jewelry. They come in all needed shapes and last a lifetime. At most hardware stores—or write direct.

Get the "How to Sharpen" Book
32 pages of pictures and data on professional tool sharpening. Send 10c to Dept. PS-10.



BEHR-MANNING • TROY, N. Y.
COATED ABRASIVES
SHARPENING STONES • MASKING TAPES
Also Manufacturers of Abrasive Paper and Cloth

The new "Evans White-Tape" has everything you'll find in tapes costing over $1.50—plus.

- snow-white blade with bold, legible, jet-black numerals and graduations. Graduated in 32nds for first 6 inches.
- sturdy die-cast case heavily chrome-plated, calibrated for quick reading inside and outside measurements.
- blade ½" wide made of finest high carbon steel—tempered—Bonderized—enamelled—baked.
- blade replaceable in seconds—without tools—without even opening case. And Evans replacement blades cost far less.
- every "Evans White-Tape" is unconditionally guaranteed.
- exclusive Evans automatic brake gives smoother push-pull action with absolutely no "creeping" of tape into case.
- underside is white, too. Mark with ordinary pencil, remove mark with flick of thumb.
- unheard-of low price*: 10-ft. $1.49; 8-ft. $1.19; 6-ft. 98¢. Prices higher in far west and Canada.

Sold only through retailers.

Evans & CO. • Newark 5, N. J. ® 7429

Makers of Evans 6-ft. Folding Rule and "Folding Yardstick"

GRAVELY MOTOR PLOW & CULTIVATOR CO.
BOX 1084 DUNBAR, WEST VA.

SOLVE!!!

GENERATOR & BATTERY PROBLEMS
WITH THE AMAZING NEW INVENTION
SELECT-A-CHARGE REGULATOR
WITH DASHBOARD CHARGE CONTROL

For Better Generator and Battery Service—Longer—Brighter Lights When You Want Them.

Bulletin S-A-C **FREE** Guaranteed. Limited Dealer Territories Open

SCIENTIFIC ELECTRIC CO. Box 2162-P, Sta. H, Cleveland, Ohio

Only $498

OTTAWA
Mule Team Tractor

Finest low-cost tractor. Costs too little to do without. Engines burn gasoline. **Seven models.** Starter and lights available. Other larger Models to choose from. Over 4,000 in world-wide use. Time-proved and tested. At low cost they easily mow, plow, disc, harrow, plant, cultivate, etc. Sold only direct to user. Write for FREE details.

OTTAWA MFG. CO., 2-101 Garden St., Ottawa, Kansas

WIRE WITCH

CUTS WIRE AND STRIPS INSULATION IN ONE SWIFT EASY MOTION!

NO CUT WIRES • NO LOOSE ENDS!

NOW $1.00 Prepaid

No C.O.D.'s Please

ADJUSTABLE STOP FOR COMMON WIRE SIZES. REMOVES INSULATION AMAZINGLY CLEAN WITHOUT INJURY TO WIRE. A real sturdy tool, made from selected tool steel, hardened and tempered. Precision ground for years of service. Thousands in use. Satisfaction guaranteed. Cuts wires perfectly . . . no frayed ends or strands.

Send One Dollar to:

THE TEE-GEE COMPANY
8-10 Railroad Street
Holyoke Massachusetts

Copyrighted material

General SALVAGE CO.

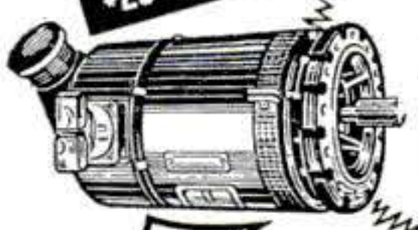
THE BIGGEST SURPLUS BARGAIN Sale! IN YEARS

BUY DIRECT FROM AD!

BUILD YOUR OWN ARC WELDER OR LIGHT PLANT

WESTINGHOUSE P-1 D-C GENERATOR

Save $250 to $500



$17.50

Instructions included. Rated 200 Amps 28 Volts 2500 R.P.M. Ship wt approx. 50 lbs. Stock No. 707

PRICE F. O. B. K. C., MO.

CONVERTS TO ARC WELDER 200-250 AMP. OR LIGHT PLANT CAP. LOAD 5000 WATTS

Stock No. 711 D.C. Generator R-1 Jack & Heints, rated 300 Amp. 30 Volts.
Gov't cost $300.00. Instruction for converting to welder or light plant incl. Also includes instructions and diagram for converting the R-1 or P-1 generator to **Combination Welder and Light Plant Included.** Only... **$27.50**

CARBON PILE Generator Voltage Regulator

For use with 24 or 32 Volt D. C. Generators. Also recommended for the P-1 and R-1 type generators in "build your own" Light plant. Complete with mounting base. Only **$6.50**

D. C. GENERATOR. Brand new. Navy Type For Farm—Home—Ranch. Delivers 430 Volts D.C. at 3450 R.P.M. Ball bearing supported. Fan cooled armature. Self lubricating bearing. #211220-A. Wt. 21-lbs Now only..... **$7.50**

New Amplidyne Motor Generator

#5AN3INJ18A—Use as 24/32 Volt D.C. motor, pulls ½ H.P. or 0/60 V. D.C. Can be adapted to 110 V. A.C./D.C. ½ H.P. by simple changes in connections. This unit can be adapted to independent and rural lighting, power, etc. Instructions incl. **(Stock #790).** Gov't cost $140.00. Wt. 30 lbs. Only **$7.50**

ECLIPSE MOTOR & GEAR UNIT

Brand new **including built in 24 V. D.C. motor.** Has 1-horizontal and 1-vertical take off shaft. Overall gear ratio to motor is 40-1, can be adapted for 2-1 or 20-1 ratio. Ideal as OVERHEAD GARAGE DOOR OPERATOR, DRIVE FOR SMALL HOIST, WELL PUMP JACK, LAWN MOWER DRIVE, DRIVE FOR POST DRILL, etc. Wt. 23 lbs. Gov't cost, $221.00. Instructions free, including simple directions for **converting unit for 110 V. A.C.** so as to be belt driven by a separate motor. Only.... **$12.95** f.o.b. KC. Mo.

VOLTMETER D.C. Brand New

The basic element of this meter is 30 Volt D.C. Voltmeter with zero center. The internal resistance is 300 Ohms. The dial may be easily calibrated to read D.C. Volts. Price..... **$3.50** Postpaid

DYNAMOTOR Brand New. Input 27 V. D.C. output 285 Volt D.C. Model #23350. Only ..... **$2.50** postpaid

Valuable Gears Bargains—Speed Reducer

10-1 or 5-1 ratio, 90 degree angle. Shaft driven ½" spline Shaft with 3 mounting holes 5/16". Gears held in forged and machined aluminum housing with two needle bearings, one bronze bearing, and three high speed shielded bearings. Sealed self lubricating chamber. Price.. **$5.50**
(Plus 35c postage)

SENSATIONAL SELSYNS

Two or more connected together, work perfectly on 110 V. A.C. For weather vanes, rotating directional antennas or controlling distance operations. Complete with diagram and instructions. Wt. 3½ lbs. PER PAIR ..... **$6.50** Postage Paid

CUNO OIL FILTER—Brand New

Aircraft type. Filters oil without cartridge replacements. Just turn handle and cartridge is clean. Standard ⅜" inlet and outlet ports to accommodate 12 gallons per minute. STOP CHANGING OIL. Instructions incl. ..... **$4.95** Postpaid

ELECTRIC MOTOR ¼ H.P. 28 Volt D.C. R.P.M. 4000 # 2832 with simple instructions to convert to 28-32 Volt A.C. Gov't cost $82.84. Brand New..... **$4.95**

ELECTRIC MOTOR ½ H.P. 24 Volt D.C. R.P.M. 2500. Amp. 22 #HCA24. Gov't cost $75.00. Brand New..... **$5.50**

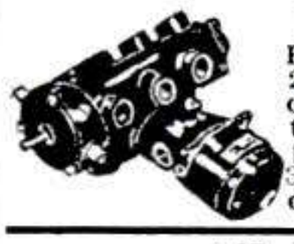
ELECTRIC MOTOR 6 VOLT D.C. Delco—New Handles 6" fan blade. Use as windshield wiper motor, hot water car heater motor, commercial or toy applications. ¼" Dia. 1⅛" long shaft. Size 5" long x 3". 2 mounting studs. 1200-2000 R.P.M. New Only ..... **$2.35** (plus 35c postage)

SOLA CONSTANT VOLTAGE REGULATOR

Pri. 95-125 Volt—Sec. Output 115 V—2000 V.A. Wt. 250 lbs. Gov't cost $369.00. Close out price f.o.b. KC. **$94.50**

BRAND NEW KIDDE HY-PRESSURE CYLINDER

Valve and safety locking pin. Applicable as tire inflator, fire extinguisher, spray painting, life raft, etc. Shatterproof. Size 12" x 2⅜". Wt. 3 lbs. Now only..... **$2.95** (plus 35c postage)



Eclipse De-Icer Distributor Valve

Brand new including built in 24 volt D.C. motor. Opens outlet ports in pair in continuous sequence. Standard pipe ports. Type 572 Model 3. Gov't cost over $250.00... **$27.50**

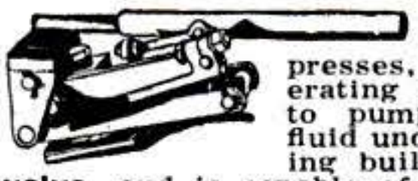
AIR FILTERS

Aircraft type. Removes dirt, dust, etc. For industry, home & laboratories. For forced warm air, conditioning units, etc. Made of heavy metallic mesh with metal frame. Permanent, needs no refills. Size 41"x6⅝"x2". Special price for quantity users. Wt. approx. 8 lbs. $25.00 value. **$3.50** ea.

Brand New Wonderful ROTATOR MOTOR

For rotating Ham, TV, FM Antennas, Turntables, Telescopes, etc. Applicable for 110 V. A.C. 60 cycles or for 24 V. D.C. as reversible motor. Approx. 7 R.P.M. Free Swing, Reversible Light Weight. Rugged, quiet. Motor & Gears oil sealed. Simple instructions & diagram incl. Wt. approx. 4½ lbs. **Stock No. 572.** $50.00 Value Now Only **$7.50** Postpaid

WEAVERS HYDRAULIC HAND PUMP



BRAND NEW. For hydraulic Jacks, presses, hoist, etc. For operating hydraulic cylinders, to pump oil or hydraulic fluid under pressure, including built in **check & relief valve.** and is capable of delivering 1000 lbs. pressure. Wt. 10½ lbs. A $50.00 value. Instructions incl. Price **$12.50** Postpaid

Pesco Vacuum Air—General Purpose Pump

Here is a pump for air, fluid, pressure or vacuum. Standard ½" pipe thread. Delivers 300 G.P.H. at 2000 R.P.M. Runs forward or reverse. Self aligning shaft. Spline terminal for direct drive, readily replaced with a pulley. Use them for oil burners, MILKING MACHINES, COMPRESSORS, VACUUM PUMP, etc. Engineering report and instructions incl. Now only..... **$9.95** Postage Paid

Pesco Centrifugal Heavy Duty Electric Pump

With built in ¼ H.P. MOTOR included. BRAND NEW. COMPLETE. Self Contained. Explosion proof. Ideal for pumping Gasoline, Oils, water and non-corrosive liquids. Applicable for 24 V. D.C./A.C. or on 110 Volts A.C. The Discharge is for ¾" hose connection. Capacity 400 G.P.H. Use them for Cottages, Basements, Laboratories, Boats, etc. Here's your Greatest PUMP VALUE IN YEARS. Engineering data and instructions incl. $85.00 value. **Stock #659.** Only..... **$12.95** F.O.B. K.C.

PUROLATOR HYDRAULIC FILTER

Filters your Hydraulic fluid, gasoline, or distillate without cartridge replacement. Protect your pump, engine, truck, tractor and motor boat with this unit. Just turn handle and element is clean. Standard ⅜" inlet and outlet ports. AVOID THAT STOPPED UP LINE. $13.00 value only..... **$4.95** Postpaid

Stratopower Constant Displacement HEAVY DUTY PUMP

For operating Hydraulic cylinders, hydraulic motors on tractors, Bulldozers, Construction machinery. Lift trucks. For fuel or oil transfer. Industrial applications, etc. Delivers up to 400 G.P.H. at 3750 R.P.M. Rated 1250 to 1400 P.S.I. 3750 to 4500 R.P.M. HAS BUILT IN RELIEF AT HEAD. Rotation either direction without adjustment. Can be used as hydraulic motor. $85.00 value. Engineering data & instructions incl. **Stock #37.** Wt. 8 lbs... **$17.50**

AIR OR OIL HYDRAULIC CYLINDERS

Stock No. 512
Double action hydraulic cylinder 2⅛" Bore, 4" Stroke, Dia. ¾" **Including built in Hydraulic control valve** which may be operated with rod or lever. Clevis mounting. Overall length shaft retracted 14". $75.00 value. Wt. 9 lbs.... **$14.95** f.o.b. KC, Mo.

Stock No. 11. Double Action **1½" bore 6" stroke.** Shaft, Clevis mounting base and shaft end. Capacity 1160 lbs. with 1000 P.S.I. input. Has a capacity of 1625 lbs. with our STRATOPOWER 1400 P.S.I. A $50.00 value. Postpaid Only..... **$8.95**

Stock # 303—Double Action 2" bore, 11¾" stroke. Dia. 1½". Overall length shaft retracted 23". 2000 lbs. capacity with 1000 PSI gives 2800 lbs. with our stratopower. Wt. 14 lbs. **$17.50** f.o.b. KC, Mo.

Stock No. 12 Hydraulic Cylinder Double Action output 12560 lbs. with 1000 P.S.I. input. Gives 17584 lbs. with our STRATOPOWER PUMP 1400 P.S.I. or will produce 34168 lbs. with 3000 line pressure. Can also be operated on low pressure system. **4" Bore, 10¾" Stroke,** 1-5/16" shaft, clevis mounting O. Govt. Cost $300.00..... **$23.50** f.o.b. KC, Mo.

Pesco Hydraulic Flow Equalizer & Pressure Balancer Valve

Brand New. Guarantees equal flow and equal pressure for Two cylinders or Two systems. Capacity 360 G.P.H. 1500 P.S.I. Data & instructions incl. A $75.00 value. **Stock 1-D-397** **$14.50** Postpaid

HYDRAULIC CONTROL VALVE

Adel Precision #B-10329. For controlling 2 single action or 1 double action cylinder. Including built in toggle lever. When lever is in one direction it puts pressure on one cylinder connection and opens exhaust, from opposite cylinder. When lever is released it returns to the neutral position and lock cylinder. Brand new. A tremendous bargain..... **$8.95** postpaid

Hydraulic Solenoid Control Valve

BENDIX. No. 81560 24V. D.C. For remote control operation and to operate one single action or double action hydraulic cylinders with 24 V. D.C. Recommended pressure 800 to 1500 P.S.I. connections are .550"—18thd. Diagrams & Data incl. $35.00 value. **$3.50** ea. **$6.50** per pair

PARKERS 3 WAY ROTARY VALVE

Brand New. With off position and is manual operated. All connections are ¾" Female I. P. This valve is ideal for 3 branch line and for low pressure fuel, water, air, or liquids. **Stock No. 23**..... **$4.95** postpaid

ALTERNATING SHUT-OFF VALVE

Brand New. High pressure. Operates by worm-gear cam operating poppets to alternately close & open either pair of four ports. Standard ⅜" pipe ports. $35.00 value only..... **$4.95** postpaid

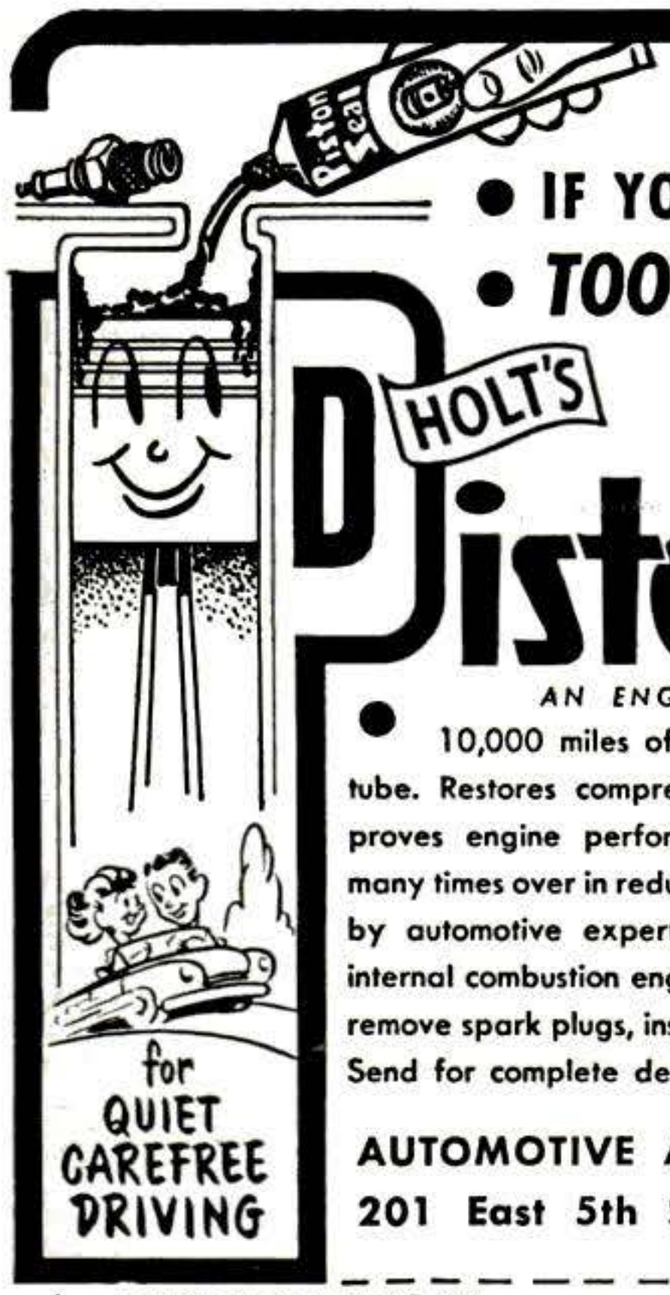
Large Volume hydraulic control and pressure relief valve, ¾" ports, spring loaded. Range 1250 P.S.I. adjustable up to 3000 P.S.I. Brand New.... **$5.50** postpaid

VICKERS CONSTANT DISPLACEMENT HYDRAULIC PUMPS. Brand New Stock No. **PF-713-20.** For any type liquid pumping job. 375 gal. per hr. at 3750 R.P.M. 1000 P.S.I. .410 cu. in. per rev. Gov. cost $100.00..... **$17.50** postpaid

Send Check or Money Order. All Prices F.O.B.—K.C. M.O. Except When Marked Postpaid. U.S.A. Only—½ Deposit With C.O.D.

GENERAL SALVAGE CO., 2922 E. 27 St., Dept. 277 Kansas City, Mo.

Copyrighted material



• IF YOUR CAR BURNS
• TOO MUCH OIL...

HOLT'S GET

Piston Seal

AN ENGLISH IMPORT

• 10,000 miles of motor oil economy in every tube. Restores compression, stops piston slap, improves engine performance, and pays for itself many times over in reduced oil consumption. Endorsed by automotive experts everywhere—improves all internal combustion engines. Anyone can install—just remove spark plugs, insert rubber tube and squeeze. Send for complete details—FREE!

AUTOMOTIVE AIDS CO., DEPT. 4-S
201 East 5th St., Plainfield, N. J.

AUTOMOTIVE AIDS CO.
201 East 5th St.
Plainfield, N. J.

RUSH DETAILS ON PISTON SEAL—*FREE!*

NAME.....

ADDRESS.....

CITY.....STATE.....

Tighten Loose Handles

TO STAY

Use the "repairman's standby" — Smooth-On No. 1 Iron Cement — to anchor loose tool and cutlery handles, knobs, pulls, casters, clothes-hooks, bolts, screws, etc. You apply it like putty — no heat required. It hardens like metal. And because Smooth-On expands slightly as it sets, your repairs *stay tight*. Buy Smooth-On No. 1 in 1¾-oz., 7-oz., 1 lb. and larger sizes at your hardware store. If they haven't it, write us.

FREE Repair Ideas

40 pages of time-saving, money-saving ways to stop leaks, seal cracks, tighten loose parts. 170 illustrations. Clear, simple directions. Send now.

SMOOTH-ON MFG. CO., Dept. 58K
570 Communipaw Ave., Jersey City 4, N. J.

Do it with

SMOOTH-ON

THE IRON REPAIR CEMENT OF MANY USES

PAY-OUT HOLD-ON REEL

SURPLUS WINCH

ONLY 32.50

Originally used by the Navy to control gunnery targets when being towed by an airplane. Ideal for many uses. This winch will pay out, hold or reel in cable or rope. It has a capacity for 4500 feet of 3/32" cable or 2500 feet of 1/8" cable. The rotating drum is gear driven and is operated by a crank handle. Drum may be rotated at 1 to 1 or 8 to 3 ratio. A brake holds drum with with ratchet & pawl to set. Size 29"x 13½"x 13"

PRECISION GERMAN MICROMETER

One of the finest quality, imported, precision tools on the market. Reads from .001. It has a ratchet stop for absolute accuracy and a lock ring to hold setting secure. Head contains decimal chart.

9.75 NEW

THESE ITEMS ARE TREMENDOUS PRECISION VALUES...

INSIDE-OUTSIDE

VERNIER CALIPER

Measures Inside - Outside & Depth from .001 to 6 in. Reads both English & Metric scales. Specially hardened jaws. Sliding jaw has lock nut to hold setting. Made by one of the leading specialists in precision instruments.

9.75 NEW

6 IN. SOLID STEEL STARRET SQUARE

Has specially hardened beams and edges, accurately ground to insure parallelism and straightness. Made of finest quality materials and highly regarded for its use as a standard square. A PALLEY VALUE for ONLY..

13.50 VALUE 8.72

DRAFTING MACHINE

Originally used in engineering dept. of one of the leading aircraft plants. Has 24" arms. Head swings 360 degrees. Clamp-on mounting. In excellent cond. Without scales.

Only 59.00

PLASTIC PARALLEL STRAIGHT EDGE

A valuable asset to the navigator, engineer, draftsman or mechanic. Has adjustment knobs. Rubber pads prevent slipping. ONLY 97¢

A-N – JC-48

HARNESS WIRE

20, 16, 12 GUAGE

Handy for emergency repairs on radios, aircraft, autos, boats, etc. Sold only in bundles of 6 pounds or more. These bundles are in mixed gauges & lengths, very clean & unravelled. This wire normally sells for 4¢ to 5¢ per foot. Here is your opportunity to have a stock of wire in assorted gauges (approx. ½¢ per ft.) 6 lbs. for ONLY 2.95

CONTINENTAL

GAS ENGINE

THAT FAMOUS SINGLE CYLINDER, 4 CYCLE, ENGINE with a GENUINE RED SEAL, Air Cooled 'L' Head. Comes complete with all accessories such as; mesh type air cleaner, flywheel, magneto, float type carburetor, fuel tank, starter pulley, muffler, blower housing, etc. An ideal power plant for small farm machinery, lighting plants, air compressors, power tools, small boats, etc. Weighs only 43 lbs. 49.50

HI-SPEED TAPS

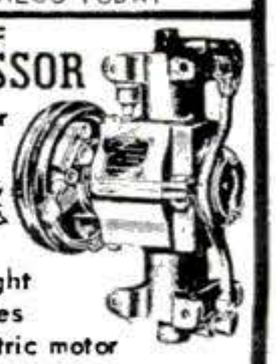
DEFENSE PLANT SURPLUS
Slightly used but perfect.

1/4-20	26¢	7/16-14	39¢
5/16-18	29¢	1/2-13	47¢
3/18-16	33¢	5/8-18	66¢
PIPE TAPS			
1/8-	48¢	1/2	$1.32
3/8	69¢	3/4	$1.83

Attention Shop Owners, Defense Plants, etc. We carry $1,500,000 stock of machine tools such as Taps, Dies, Cutters, Reamers, etc.
SEND FOR CATALOG TODAY

WESTINGHOUSE

AIR COMPRESSOR

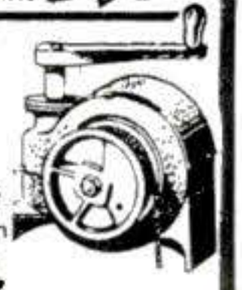


1000's now in use for spraying, inflating, air tools, in garages, laboratories, shops & on trucks, tractors, jeeps, etc. Lightweight but powerful. Operates on ½ HP, gas or electric motor Runs either direction. Delivers approx 3.27 CFM at 600 RPM or 6.54 RPM. at 1200 Rpm. Has 2" bore, 1½" stroke.

We have motors, tanks and fittings to adapt this unit. 23.95

TINY MITE

WINCH HOIST



This mighty little giant lifts up to 1000 lbs with its 30 to 1 Bronze gear drive. Cable drum is 4" x 1¼". Ratchet handle, safety & release pin. Ideal for Boats, Farm, Factory, Shop. ONLY 12.95

SEE OPPOSITE PAGE FOR TERMS

PALLEY SUPPLY CO.

6321 San Fernando Road, Dept. PS-10, Glendale, 1 California.

Copyrighted material

SAVE UP TO 85% IN WAR SURPLUS from "GADGETEERS HEAVEN"

HYDRAULIC CYLINDER SPECIAL

Gives 20,000 lb. thrust (push pull) using 1500 PSI line pressure as obtained from our hyd. pumps. Or will produce 40,000 lb. thrust with 3,000 lb. line pressure. CAN ALSO BE OPERATED ON LOW PRESSURE AIR SYSTEMS. 4" Bore, 1½" dia. piston shaft, 18" stroke, length 30½". Equipped with ball bearing loaded clevis type mounting and swivel type high pressure steel pipe bracket for easy use. Ideal for road, farm & shop machinery, presses, etc. Cost Gov't $390.00 **29.95**

We carry the World's Largest Supply of Special Hydraulic Equipment featuring over 20,000 Cylinders in 61 Sizes and Types. Can also supply all accessories such as Pumps, Valves, Tanks, Hose and Fittings. Write for information.

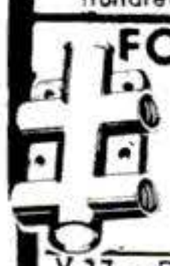
No. 3 HYDRAULIC CYLINDER

Double action. Bore is 1". Shaft ½". Has a stroke of 2½" to 4". Stroke can be adjusted with internal sleeve stops. Overall length is 8½". Will take 1500 lbs. continuous duty. 3000 lbs. intermittent. Will lift or push to 1100 lbs. **5.75**

No. 9-E HYDRAULIC CYLINDER

Double action cylinder. Has a bore of 1-3/8" and shaft of 1". Stroke is 9". Overall length 15¾". Built for 1500 lbs. continuous duty. 3000 lbs. intermittent. Will lift or push up to 2300 lbs. . . . Can be adapted to hundreds of uses **9.75**

FOUR WAY VALVE



V-9A – – LARGE VOLUME PRESSURE RELIEF VALVE ½" Standard pipe ports. Pressure setting – approx. 1200 PSI. Range 1000 to 2100 PSI. **5.75**

V-17 – Poppet type, pressure balanced Has piston with built-in relief valve to limit cylinder strokes. Inlet and outlet ports have ½" std. pipe ports. ½" A.C. tube to cyl. (¼" x 18 thread) **9.75**

STRATO POWER PUMP

With built-in variable flow control valve in head. Positive displacement piston type. displaces .450 cu. in. per revolution. 2 gal. per. min. cap. at 1500 RPM at 1250 PSI. Pressure limit, 1250 PSI continuous, 1400 PSI for 15 sec. Operates at 3750 RPM, intermittent maximum 4500 RPM. Rotates either direction without adjustment **19.50**

GEROTER TYPE PUMP

Logan Geroter type. For operating hydraulic systems on trucks, tractors, etc. Delivers 8 GPM at 1200 RPM at 1000 PSI with 5 H.P. Can also be used as Hydraulic fluid motor. 3/8" std. pipe ports, 1/2" splined shaft for pulley or direct attachment. 5½" dia., 7" long. Used but condition guaranteed. **19.50**

TWO HEAT SOLDERING IRON

This is really **TWO IRONS in ONE!!** A control button in handle selects 150 or 300 watt heat. Full size iron for light & hvy work. Removable, solid copper tip. Complete with cord & tip. **4.95**

200 Pg. CATALOG SAVE UP TO 85% ON WAR SURPLUS

1000's of MONEY SAVING Bargains for the Mechanic, Housewife, Manufacturer, Hobbyist, etc. Clothing, Tools, Machinery, Metals, Electrical Supplies, Motors, Rubber, Plastics, Hydraulic supplies (cylinders, pumps, motors, valves, fittings, hose, etc). Send 25¢ to cover mailing & handling.

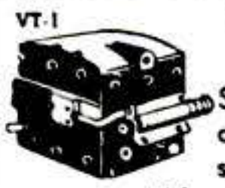
NOW! MAKE YOUR OWN ARC WELDER!

HERE'S A REAL BUY! Finest, Precision built, R-1 Generators, originally used on B-29 Airplanes. These generators cost the Government approximately $400.00 each. Gives from 300 to 400 amps at 27 volts. Ideal for all welding, light & hvy up to 5/8" thickness. Free instructions for converting to welding unit. **27.95**

Other AIRCRAFT GENERATORS

P-1	27 Volts	200 Amps	15.95	E-5A	12 to 15 Volts	50 Amps	12.95
1273-1A	27 Volts	75 Amps	15.95	03	27 Volts	100 Amps	25.00

VICKERS HYDRAULIC Transmission

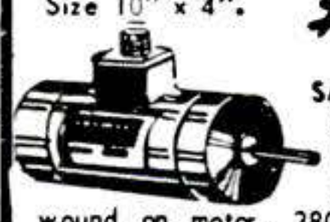


VT-1 Self contained, 2 H.P., constant torque at all speeds with variable volume reversible, piston pump (controlled by outside lever) supplying piston hydraulic motor. Automatic pressure, dash pot for smooth control. Power output RPM –0 to 1/3 input RPM in both directions. Input RPM 1800 continuous. 4000 intermittent. Dash pot can be removed for greater RPM. Ideal for lathes, duplicator set-up on mills, conveyors, small cars, drives, gearings, etc. **32.50**

4" SPLINE SHAFTS for input & power take-off . . . . . **2.50 PR**

ELECTRIC MOTORS

LEAR ELECTRIC MOTOR. 24 volt, 6 amps, series wound reversible motor with overload clutch. Motor turns 11,000 R.P.M. Has 11 to 1 gear reduction box turning 1000 R.P.M. at take-off. Adaptable to flex or rigid drive. Limit switch box. Size 10" x 4". **$7.95**



SAMSELL MOTOR 27 volts, 16 amps 1/5 H.P. reversible, series wound on motor. 3800 R.P.M., shaft 9/32" diameter. 12-spline. 4-1/8" x 2-3/8". ONLY **3.95**

SURPLUS MOTORS

No. 500 – New ½ H.P. – 27 Volt, D.C.-A.C. This motor can be readily adapted to deliver up to ½ H.P. on 110 Volts, A.C. by the simple method of rearranging armature brush-leads. Free diagram with each order. A sensational value . . **5.95**

No. 500-A – Converted to 110 Volts-A.C. Equipped with plug and 3½ ft. Heavy duty cord . . . **8.49**

D.C. METERS

AMMETERS
- 30-0-30+
- 60-0-60+
- 120-0-120+
- 0-120 : 0-240
- 0-300

Any above ammeters. **3.95**

VOLT METERS 0-30 **4.95**

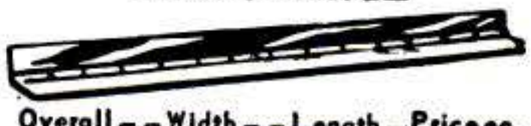
COMBINATION VOLT AMMETERS
30 V. – 30 AMP.
30 V. – 60 AMP.
Only 4.95

ABOVE AMMETERS HAVE 2" FACE EXCEPT 0-300 WHICH HAS 3" FACE

IT IS NECESSARY TO USE **SHUNTS** WITH ALL D.C. AMMETERS

30-A 60-A 120-A
150-A 240-A 300-A **1.25**

PIANO HINGE

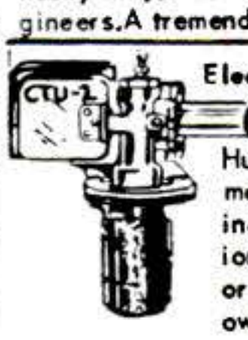


Overall – – Width – – Length – Price ea.
1¼" - (5/8" side) - 72" alum. - $1.00
3½" - (1¼") - 54" st. steel - $1.69
BRASS HINGE - 1¼" (5/8" side - .040 thick) Any length at . . .per ft. .29

ATTENTION GADGETEERS

Electric GYRO

Turns up to 50,000 R.P.M. Electric drive motor is integral part of balance wheel. Has double end shafts to drive precision tools or machinery at precise, controlled speeds. Full ball bearing mounted. Operates high or low voltage A highly precise instrument, ideal for experimental work, science labs, hobbyists, & technical engineers. A tremendous buy **4.95**



Electric ACTUATOR

Hundreds of uses for any mechanical device needing controlled 2-way action. Opens, closes, raises or lowers doors, windows, gates, valves.

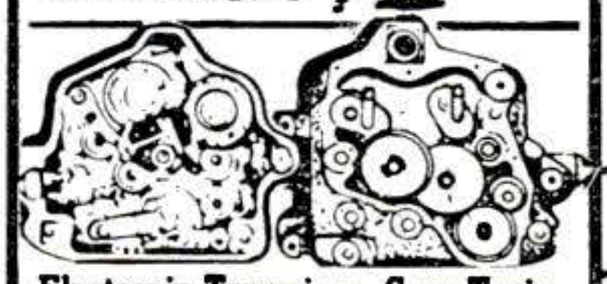
CTU-2 Foote linear actuator. 24 Volt, A.C. or D.C., 8500 R.P.M., 1/6 H.P. – Series wound motor. 4½" stroke in 13½ seconds. Compression and tension loads up to 750 lbs. Adjustable micro-switch for limits of travel. Overall length retracted 11" **6.95**

GEAR HEAD MOTORS

Heavy Duty G.E. Gear Head Motor. 1½ H.P., 24 volt DC, 125 amp reversible motor will drive reduction gear box unit 44.5 to 1, resulting in 168 R.P.M. at 5/8" diameter take-off shaft. Motor contains electro magnetic break.

UNIT COMPLETE **10.95** MOTOR **4.95**

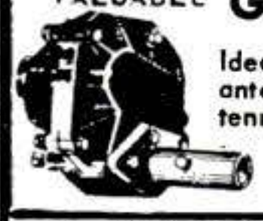
GEAR BOX ALONE **7.95**



Electronic Trnsmissn. Gear Train

GT-1 – approx. 50 Bronze Spur & Pinion Gears, 3/8" to 4" dia., 5 sets of 7 cluster gears, 2 complete worm and worm gear drive sets, 40 N.D. ball bearings ½" to 1½" dia., watch springs, bushings, posts, face plates, housings, micro switches 2 miniature controlled clutches, etc. . . Gears in multiple size and sequence identical teeth ratio, giving 100's of gear reduction combinations . Wt. 19 lbs. **8.49**

VALUABLE GEAR BARGAIN



Ideal for moving radio antenna, television antenna, etc. **Only 6.75**

GEAR BOX – VTG-1 – 90° – bevel gear 1½ to 1 reduction. A lifetime value . . . . . Size: 7" x 6" . . . **3.95**

Has lever control for engaging & disengaging positive clutch. Dust proof housing, pre-lubricated bearings . . . Can be adapted to Vickers Transmission.

PALLEY FAMOUS MIXES!! Prepared especially for the HOME CRAFTSMAN, HOBBYIST, INVENTOR, GADGETEER or SHOP MECHANIC.

GADGET MIX – Rivets, Spacers, Bolts, Screws, Gears, Wheel bearings, Springs and Clamps. No. 106, 5 lbs. **1.19**

BEARING MIX. No. 170A. Approx. 20 needle, Ball & Roller Bearings, New & Used. Sizes: 1/2" to 4". Some of these cost Gov't $10 a piece. Never such a value! 5 lbs. **ONLY** **1.59**

HINGE MIX, No. 170H. 12 pairs of Strap and butt hinges, Hasps, 1" x 1" to 7/8" x 10" in length and 8" strap. 2 lbs. **1.09**

ABRASIVE AND GRINDING WHEEL MIX – 50 pieces including honing stone, pencil rolls, wheels, etc. A sharp value. No. 170AG **99¢**

SPRING MIX, No. 206 – Torsion, Compression & Tension Springs. Asstd. sizes. A treasure trove for emergencies. Scores of springs. 5 lbs. for **ONLY**. **1.69**

RIVET MIX – 3 POUNDS – Consisting of sizes from 1/4" to 3" long in many diameters & alloys. **1.19**

FILE MIX – Ten assorted Files – 4" to 12". Includes Vixens, half rounds, mills, bastards, etc. – in seconds and used but good condition. 1 Vixen alone is worth our price for entire mix. . . **99¢**

PULLEY MIX – You'll want this one around. 10 micarta & metal pulleys ranging from 1" to 5" with ball and one piece bearings. These are aircraft pulleys, the best made – with hundreds of uses. A WONDERFUL BUY! **2.95**

SCREW MIX – 5 lbs., Including assortment of wood and machine screws. Many sizes. Save dollars and always have plenty of screws on hand. . **1.39**

NUT MIX NM-1 – 3 lbs. approx. 500 nut. Anchor, Lock, Castle, Hex, Elastic Stop Nuts, etc. You'll always have plenty of Nuts in the shop. NM-1 **1.39**

SUPER COMBO MIX – No. SC2. Here's a real bargain. All ten above mixes for **ONLY** **12.95**

AIRCRAFT CABLE

Rust resistant, alloyed steel. Extra flexible. Pre-formed, 7 x 19 strand. On reels.

1/16" – 4½¢ ft.	3/16" – 9½¢ ft.
5/64" – 5¢ ft.	7/32" – 10½¢ ft.
3/32" – 5½¢ ft.	1/4" – 12½¢ ft.
1/8" – 7¢ ft..	9/32" – 15¢ ft.
5/32" – 7½¢ ft.	5/16" – 16½¢ ft.
1/2" – 20¢ ft.	3/8" – 18¢ ft.

Special! 3/16" cable, 18 ft. long with turnbuckle ends . . . . . .99¢

Stainless Steel Cable – Pre-formed

1/16" – 6¢ ft.	5/32" – 20¢ ft.
3/32" – 14¢ ft.	1/4" – 26¢ ft.

Bronze Cable – Not Pre-formed

1/16" – 5¢ ft.	3/16" – 23¢ ft.
1/4" – 17¢ ft.	1/2" – 38¢ ft.

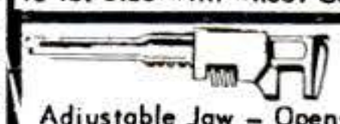
Plow Steel Cable Hemp Center 6 x 19
7/8" . . . . 25¢ ft. 1" . . . . 28¢ ft.

FIRE EXTINGUISHER

Kiddie Lux – CO^2 Type. Built to Gov't specifications. Heavy, shatter-proof case. Recent hydro-static test. Reconditioned and fully charged.

READY FOR INSTANT USE!!

2 lb. size with Swing Nozzle . . . 13.75
3½ lb. size with Swing Nozzle . . . 17.95
7½ lb. size with Horn 23.75
10 lb. size with 3½ ft. flexible hose and Horn. . 29.75
15 lb. size with Wheel Control . . 34.95



15" MONKEY WRENCH

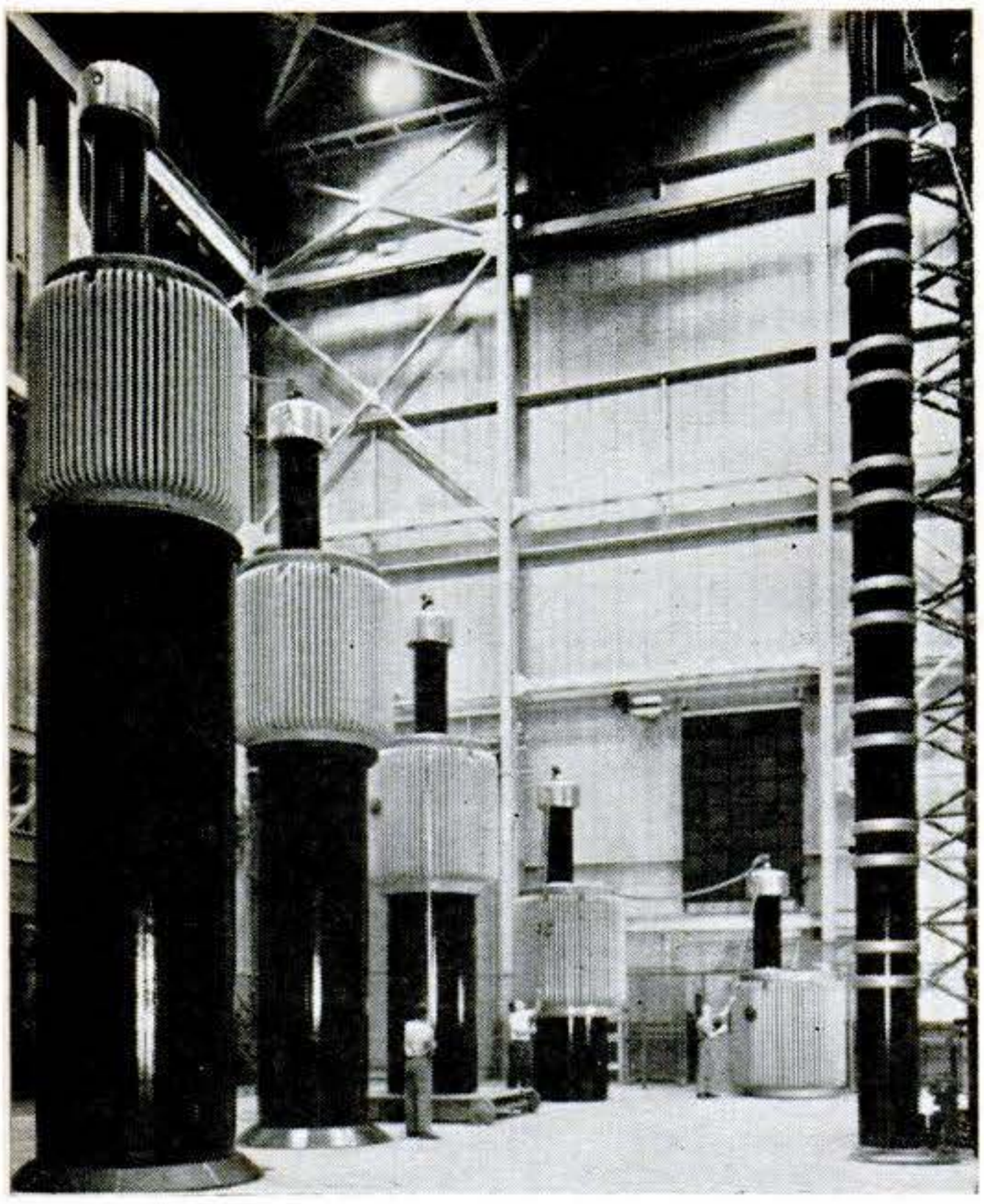
Adjustable Jaw – Opens to 4" Drop Forged. . .Auto Type. Black **97¢**

Order from this ad. All sales final. Prices F.O.B., Glendale. Pay by M.O. or check. P.O.'s accepted from D&B firms. ½ deposit with C.O.D.'s.

PALLEY SUPPLY CO
6321 SAN FERNANDO RD.
Dept. PS-10 GLENDALE 1, CALIF.

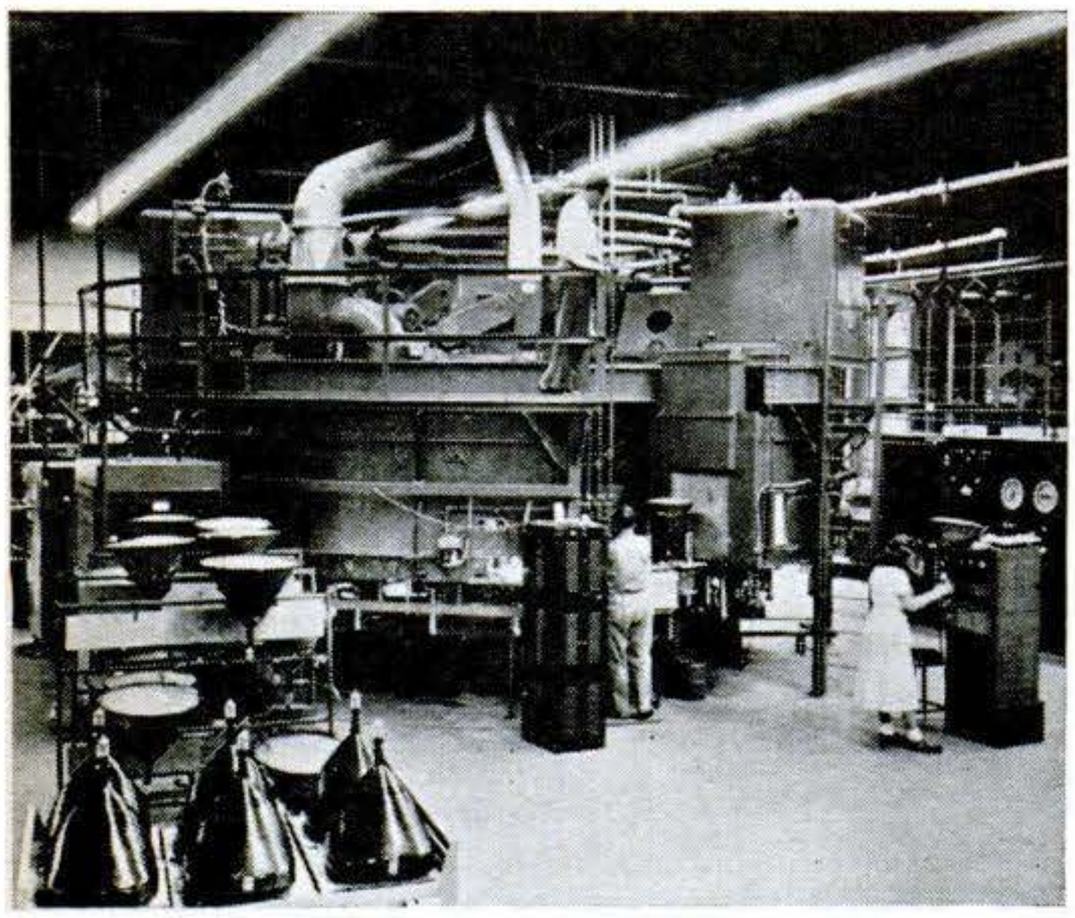
LARGEST FIRM OF ITS TYPE IN THE WORLD

Copyrighted material



Transformers Test Power Lines

THE five giant transformers above are in for a big shock. Placed on successively higher insulating towers at GE's High Voltage Laboratory, Pittsfield, Mass., the units will be purposely short-circuited at 1,590,000 volts to study the effects of lightning on power lines. Such research helps develop more efficient means of transmitting electric power.



Big TV Tubes Get Big Machine

THIS giant automatic machine exhausts the air from two dozen 24-inch television viewing tubes at the same time. Thirty feet in diameter and costing more than $200,000, it is said to be the largest equipment of its kind. Sylvania Electric Products, Inc., is the builder.

All About Russian Cars

[Continued from page 111]

The same writer goes on with an example: ". . . A worker tries to remove three screws from a cover with gasket; as he has not brought the suitable monkey wrench, he might fix it with a hammer and screwdriver. He breaks one screw and as he can find no proper screw to fit the hole again, he simply forces another one into the thread . . . what does it matter if the thread of this valuable machine goes to the devil; the gasket will hold—at least until the next repair."

USSR Has Vast Resources and Man Power

But the standards of success in the Soviet are not the same as in other countries. As the former prisoner of war, quoted above, wrote: "The managers' state of Russia dominates its labor in a way that is quite impossible for us to grasp. The state extends its rule to every phase of living of the workers to such a degree that it has complete control over the liability side of the profit and loss account. Therefore, working at a loss in our sense of the word is practically nonexistent."

Despite all the talk about the inefficiencies of the Russian auto industry, we should be mindful of other warnings. Russia now controls the valuable auto industries of East Germany and Czechoslovakia. And we must remember that tremendous resources in raw materials and raw man power can be poured into a project on a scale that makes up for the waste and inefficiency. Russian tanks and aircraft, for example, have shown themselves to be of good quality and are produced in large quantities. It may even be that some of the deficiencies of the auto industry are due to concentration on more warlike vehicles. END

Eye Changes Shape to Focus

THE human eye, unlike the lens of a camera, changes its focus by actually changing its shape. Contraction of an eye muscle flattens the lens for viewing faraway objects. The camera lens accomplishes the same effect by moving closer to the film.

Aluminum Most Plentiful Metal

THE world's most abundant metal is aluminum, which makes up 1/12 of the solid portion of the earth's surface.

Copyrighted material

want better results in your workshop...

FRANKLIN GLUE IS BEST FOR ALL WOODWORK

Genuine HIDE glue, strongest known. Easy to use . . . no mixing, no heating. No odor. Eliminates chilled joints. *Actual laboratory tests prove Franklin Glue holds more than 4000 lbs. per sq. in. and shows 100% wood failure.* Spreads thin, goes farther. Costs no more than ordinary glues. Ideal for all home uses. If your dealer cannot supply you, *send this coupon with 20¢*

15¢ AT ALL HARDWARE STORES

The FRANKLIN GLUE CO., 115 W. CHESTNUT ST.
Columbus 15, Ohio

Enclosed 20c (15c plus 5c postage and handling charge) for trial tube of Franklin Liquid Hide Glue.

NAME.....

ADDRESS.....

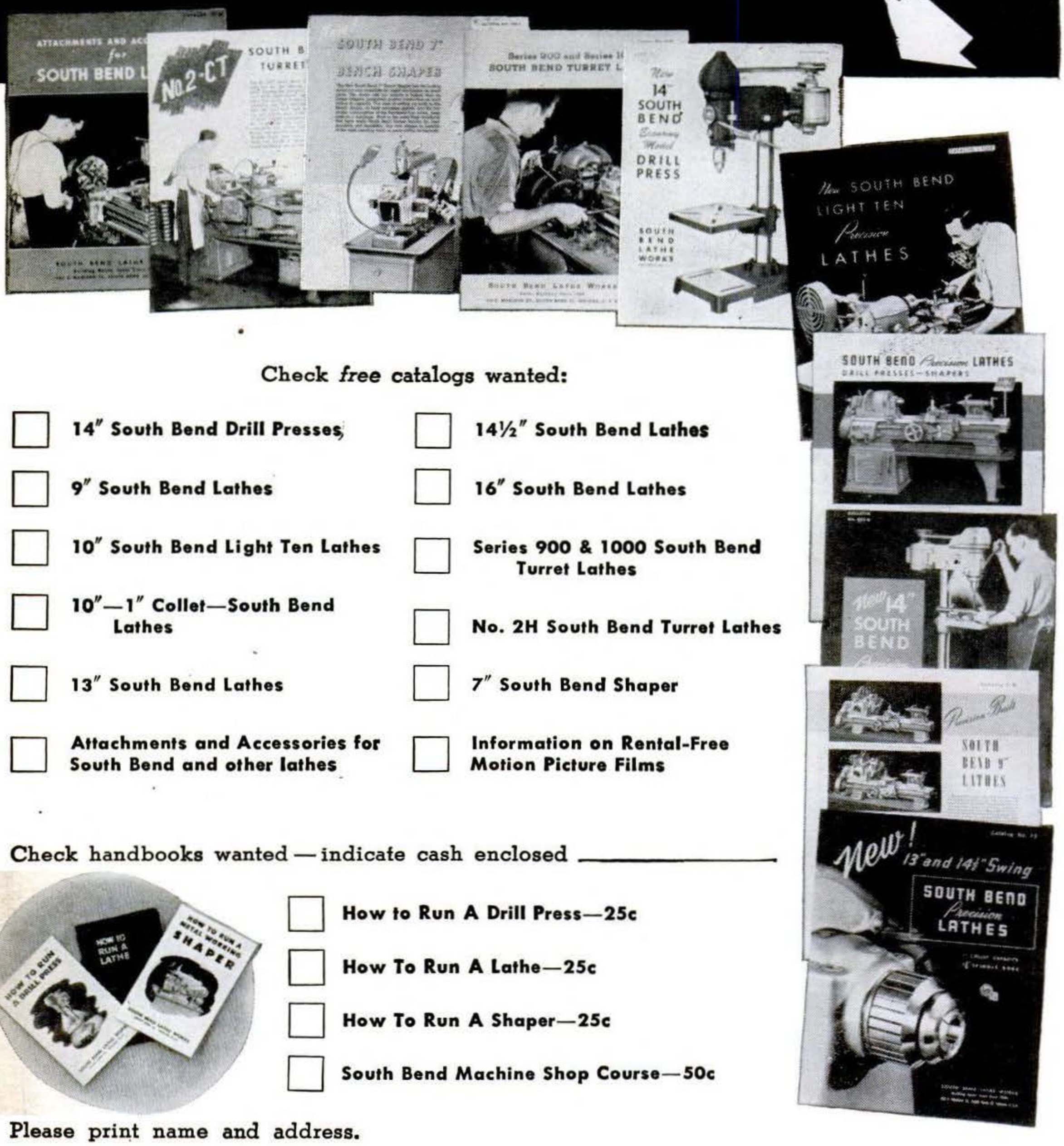
.....

SIX SIZES: Available in tubes 15c; quarter pints 50c; half pints 85c; pints $1.50; quarts $2.65; gallons $7.50.

Copyrighted material

HELPFUL BOOKS

EVERY MACHINIST SHOULD HAVE



Check *free* catalogs wanted:

- ☐ **14″ South Bend Drill Presses**
- ☐ **9″ South Bend Lathes**
- ☐ **10″ South Bend Light Ten Lathes**
- ☐ **10″—1″ Collet—South Bend Lathes**
- ☐ **13″ South Bend Lathes**
- ☐ **Attachments and Accessories for South Bend and other lathes**
- ☐ **14½″ South Bend Lathes**
- ☐ **16″ South Bend Lathes**
- ☐ **Series 900 & 1000 South Bend Turret Lathes**
- ☐ **No. 2H South Bend Turret Lathes**
- ☐ **7″ South Bend Shaper**
- ☐ **Information on Rental-Free Motion Picture Films**

Check handbooks wanted — indicate cash enclosed _____

- ☐ **How to Run A Drill Press—25c**
- ☐ **How To Run A Lathe—25c**
- ☐ **How To Run A Shaper—25c**
- ☐ **South Bend Machine Shop Course—50c**

Please print name and address.

Name_____ **Street**_____

City_____ **Zone**_____ **State**_____

SOUTH BEND LATHE

SOUTH BEND 22, INDIANA • *BUILDING BETTER TOOLS SINCE 1906*

Copyrighted material